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Statement of Authorship.

This article was prepared by specialists in the Bureau of Plant Industry, the Bureau of Agricultural Economics, the Bureau of Entomology, and the Weather Bureau, under the general supervision of a committee composed of W. W. Garner (chairman), E. G. Moss, Otto Olson, L. S. Tenny, O. C. Stine, H. S. Yohe, R. H. Wilcox, M. Dorset, A. L. Quaintance, S. H. McCrory, C. F. Marbut, and J. Warren Smith.

The principal contributions were made by the following:

From the Bureau of Agricultural Economics: O. C. Stine, illustrative material covering world production, historical development, acreage, yield, and production of tobacco, and present geographical distribution of production; Albert P. Brodell, cost of production; H. S. Yohe and F. B. Wilkinson, jointly, tobacco marketing and prices of leading types; Lewis B. Flohr, farm prices of tobacco; George K. Holmes, statistical scientist, digest of import duties on tobacco under the Constitution; Nat. C. Murray, chief statistician, verification of a considerable portion of the statistical data used in the article.

From the Bureau of Entomology: J. L. Webb, insects affecting tobacco.

From the Bureau of Plant Industry: W. W. Garner, general supervision and discussion relating to world production, historical development, distinctive types of tobacco, major portion of text on production, and the sections on extent of the industry, exports and imports, domestic consumption, internal revenue taxes on tobacco, summary and outlook; E. G. Moss and Otto Olson, jointly, portion of text on factors influencing production and international trade in tobacco; James Johnson, diseases of tobacco.

From the Weather Bureau: J. Warren Smith, correlation of weather and yield of tobacco.

HISTORY AND STATUS OF TOBACCO CULTURE



By W. W. GARNER and E. G. MOSS, *Bureau of Plant Industry*; and
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Extent of the Industry.

THE size of the tobacco crop appears small when compared with the enormous production of such crops as wheat, corn, and cotton. The tobacco acreage constitutes about five-tenths of 1 per cent of the acreage devoted to all crops. In the census year 1919 the value of the tobacco crop was about 3 per cent of that of all farm crops. Nevertheless, the acreage and production of tobacco are large, and the value of the crop is exceeded only by that of corn, hay and forage, cotton, wheat, oats, and potatoes. Of the staple crops rye and barley, in addition to the preceding, surpass tobacco in acreage. According to census returns for 1919, tobacco was grown in 42 States, in 1,694 counties, and on 448,572 farms. The crop of 1,465,481,000 pounds was produced on 1,951,000 acres of land and was valued at \$570,868,000. During the five-year period 1917-1921 the average area in tobacco was 1,702,000 acres, the production averaged 1,362,000,000 pounds, and the average value of the crop was \$364,620,000, according to estimates of the Bureau

of Agricultural Economics. Tobacco culture is largely localized in a comparatively few States, and in several States extensive culture is limited to only a few counties. In some localities tobacco culture becomes the dominant feature of agriculture. The three States, Kentucky, North Carolina, and Virginia, produce nearly two-thirds of the total output of the country, and Kentucky alone produces a third of the total. In 1919 tobacco was grown on 143,599 farms in the latter State and 640,241 acres were devoted to the crop. North Carolina stood first in value of the crop, which returned to the farmers more than \$151,000,000. This amount was 30 per cent of the value of all farm crops of the State. Lancaster, Pa., is the leading county of the United States in acreage and production, and in 1919 produced 49,335,000 pounds on 37,301 acres. Hartford, Conn., the second county in production, leads in the value of her crop, which in 1919 was worth \$13,000,000, or more than two-thirds of the value of all crops produced.

The United States leads the world not only in the total production of tobacco but also in the number and diversity of distinctive types produced. Types of leaf especially adapted for all forms in which tobacco is used are produced in important quantities. The tobacco crop is the basis of extensive and varied manufactures, affording employment to many persons and involving large investments of capital. The magnitude of these operations is indicated by the census returns, which show that in 1919 the number of tobacco-manufacturing establishments was 10,291, with a capital investment of \$604,839,572. Employment was afforded 183,565 persons, who received as salaries and wages \$153,299,012, and the aggregate value of manufactured products was \$1,012,933,213. Manufactured tobacco has long been an important source of revenue for the Government, and in 1921 the amount derived from this source was \$254,035,199.

World Production.

Tobacco is grown in considerable quantity in various parts of the world. (Fig. 1.) As far as statistics are available the 11 countries producing upward of 50,000,000 pounds annually during the pre-war period, 1909 to 1913, are, in

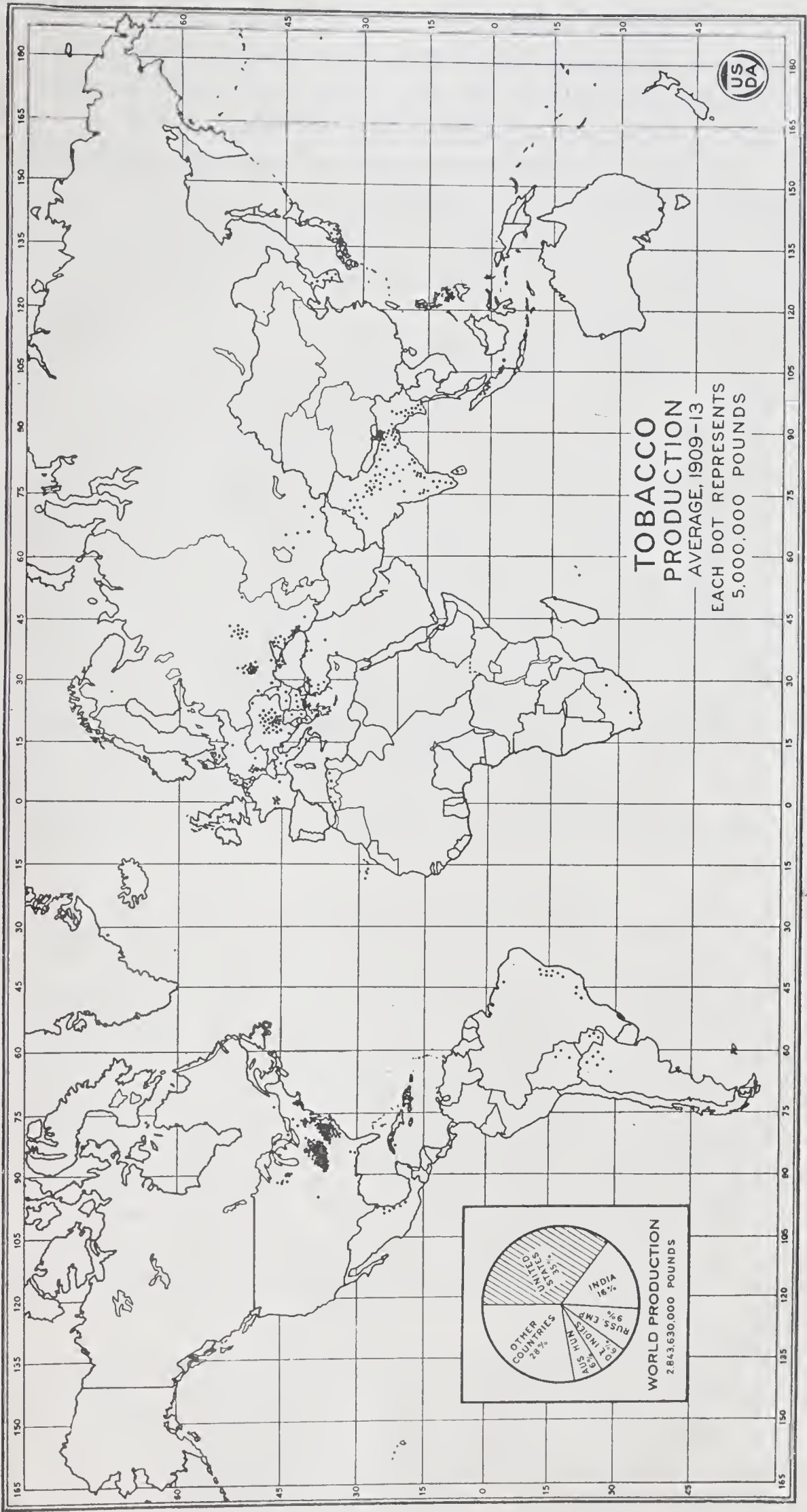


Fig. 1.—Tobacco may be grown successfully under a wide range of conditions of soil and climate, as shown by the fact that this crop is an important one in many parts of the world. The commercial value of the product, however, is influenced to an extraordinary degree by soil and climate so that the product of different countries varies greatly in market value.

the order of quantity produced, the United States, British India, Russia, Hungary, the Dutch East Indies, Japan, Germany, Philippine Islands, Brazil, Cuba, and northern Caucasasia. The production of China undoubtedly is very large in the aggregate, but for that country nothing more than fragmentary statistics are available. It is estimated that world production for the period 1909 to 1913 averaged approximately $2\frac{8}{10}$ billion pounds, of which the United States furnished 35 per cent.

It is apparent that the tobacco crop of the world is produced under widely contrasted climatic conditions and on very diverse types of soil. The tobaccos thus produced differ greatly as to properties which determine their usefulness for different forms of manufacture, and consequently there are wide differences in the commercial value of these tobaccos. Most countries can readily produce large quantities of tobacco but only of a relatively inferior grade, while only a few countries possess areas having the necessary soil and climatic conditions for growing tobacco of superior merit. So important are the effects of soil and climate on the quality of the tobacco produced that even in those countries which, as a whole, grow a product of relatively low-grade, tobacco culture is more or less definitely localized.

Acreage, Yield, and Production in the United States.

In 1866 the estimated area in tobacco was slightly more than a half million acres and, with a fairly steady rate of increase, the acreage first passed the million mark in 1899. (Fig. 2.) Beginning with 1904, there was a 5-year period of reduced acreage, followed by a marked increase to an average of nearly $1\frac{1}{2}$ million acres for the 5-year period, 1917 to 1921. The acreage, therefore, has tripled in a half century. In 1920 the acreage approached the 2-million mark, but low prices resulted in a marked reduction in the area planted in 1921.

The yield per acre fluctuates widely from year to year, the lowest average yield for the country during the past half century, namely 569 pounds, being that of 1869. The highest average yield for this period was 894 pounds, in 1911.

TOBACCO: UNITED STATES, 1866-1921.

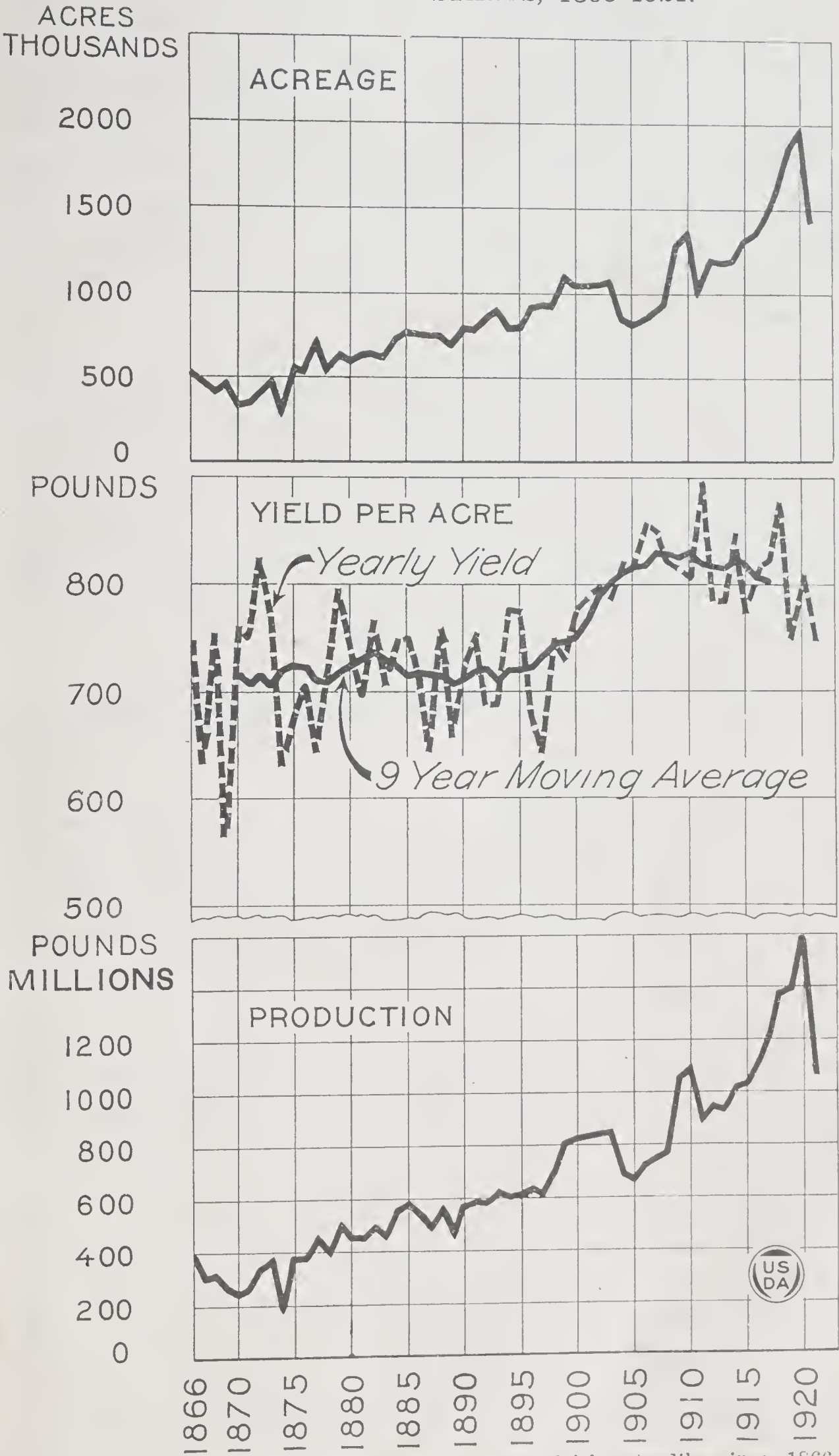


FIG. 2.—The acreage of tobacco has increased fairly steadily since 1866. Production has increased more rapidly than acreage owing to a higher yield per acre.

Using nine-year moving averages to smooth out seasonal influences, it is seen (Fig. 2) that there was no marked change in average yield per acre during the first 30 years of the period covered. Beginning about 1897, however, the average yield advanced from about 715 pounds to more than 800 pounds per acre within a decade. This increase in yield was due in part possibly to the extension of tobacco culture into new territory, but the principal factor was the increased use of fertilizers. There has been no further decided change in average yield per acre.

The total production has increased from an average of about 350,000,000 pounds for the 10-year period ended in 1879 to 1.1 billion pounds for the 10 years ended in 1919. This increase in production is due chiefly to increase in acreage, only a small fraction being accounted for by increase in acre yield. The crop of 1920 was the largest ever grown, the estimated production for that year being 1,582,225,000 pounds. The 1921 crop, however, amounted to only 1,075,418,000 pounds.

Tobacco Culture a Highly Specialized Industry.

Historical Development.

At the time of the discovery of America the natives were growing tobacco from Canada southward as far as southern Brazil. Early records show that the aborigines understood the more fundamental features of tobacco production as now practiced, including the details of proper spacing in the field, topping and suckering the plants, and the distinctive processes of drying now known as air curing, sun curing, and fire curing. Spanish settlers began commercial tobacco culture in the West Indies and Central America and South America long before Jamestown was established, so that at the outset the tobacco produced by the Virginia and Maryland settlers was forced to meet the competition of the Spanish product when sent to Europe. Nevertheless, tobacco promptly became a leading article of exchange with the mother country, and its culture has remained a permanent feature of agriculture in Virginia and Maryland. Throughout colonial days, when Virginia and Maryland produced the bulk of the crop, there was a tendency for production

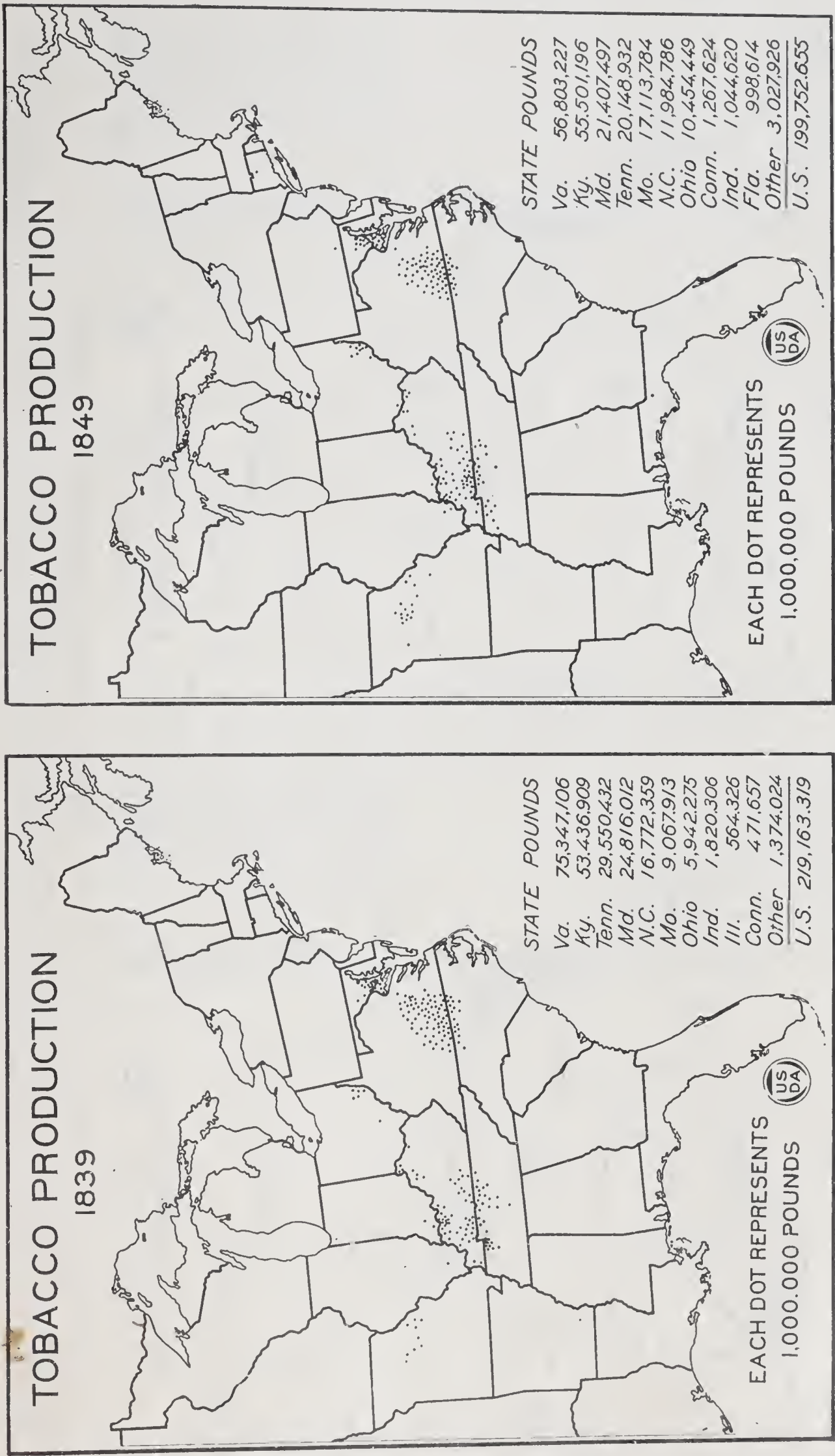


FIG. 3.—In 1839 the tobacco crop was grown mainly in the States of Virginia, Maryland, North Carolina, Kentucky, and Tennessee. During the decade 1839–1849 there was no marked change in total quantity of tobacco grown or in distribution of production.

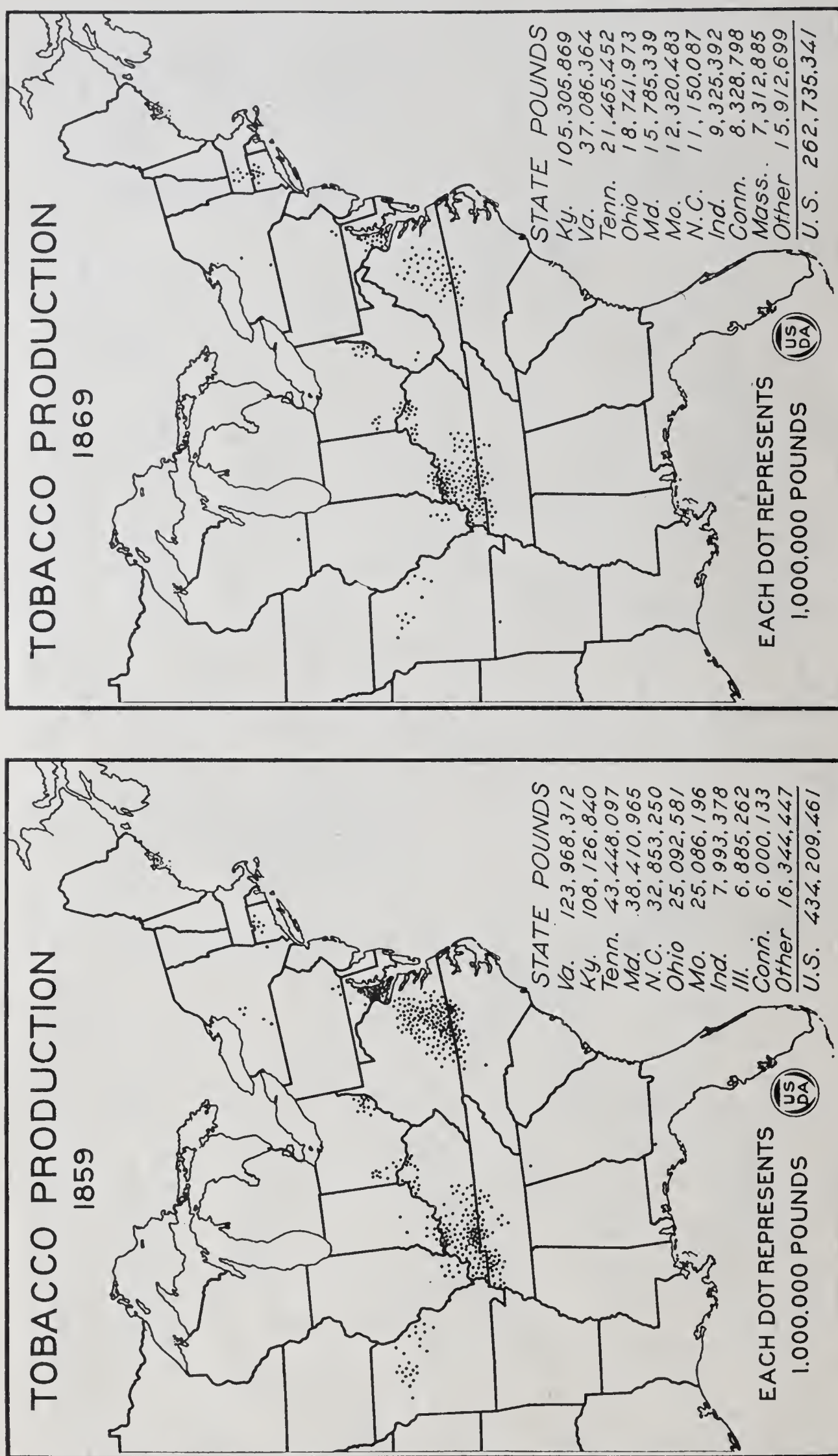


FIG. 4.—By 1859 production had increased greatly in the leading tobacco-growing States, the crop of that year being more than twice as large as the 1849 crop. In the decade 1859-1869 influences of the Civil War caused a shift in the center of maximum production from Virginia to Kentucky where it has since remained. Production for the country as a whole also was greatly curtailed.

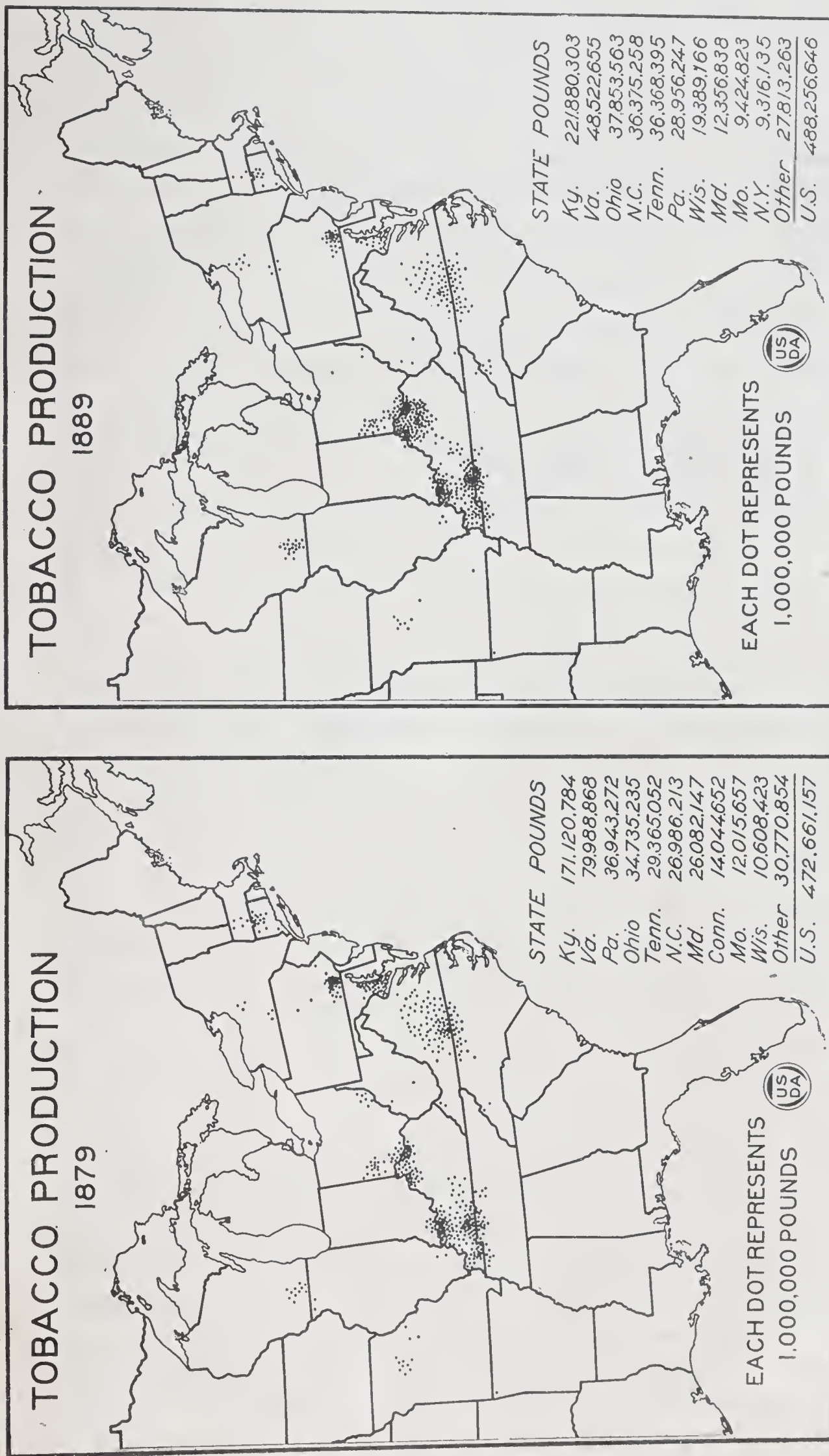


FIG. 5.—In the decade closing with 1879 there was a notable increase in production in northern tobacco-growing States, especially in Pennsylvania and Wisconsin. There were no striking changes in distribution of production in the period 1879–1889 except a marked expansion in production in north central Kentucky.

to increase more rapidly than European demand, thus causing very low prices. Tobacco was a constant object of legislation in vain efforts to remedy this situation by such devices as fixing prices, limiting production, and providing penalties for false packing. By 1664 tobacco exports in Virginia and Maryland had reached nearly 24,000,000 pounds, and by 1770 the portion of the crop exported averaged about 100,000,000 pounds. During the following half century trade disturbances, resulting largely from the Revolutionary War and the long series of Napoleonic wars in Europe, materially checked further expansion in the production and exportation of tobacco. During this period, however, tobacco culture assumed increasing importance in Ohio, Kentucky, and Tennessee.

Changes in leading centers of tobacco production from 1839 to date are shown in Figures 3 to 6, inclusive. In 1839 the bulk of the crop was grown in Virginia, Kentucky, Tennessee, Maryland, North Carolina, Missouri, and Ohio, the two first named States furnishing nearly 60 per cent of the total. During the following decade there was little change in distribution of production, except that the crop of Missouri increased considerably. In 1859 production had increased in all the above-named States, and in addition the crop had become of some importance in the Connecticut Valley and in New York and Indiana. Virginia and Kentucky still produced more than half of the total crop. During the following decade the Civil War greatly curtailed production in Virginia, North Carolina, Maryland, and Tennessee, with the result that Kentucky assumed a commanding lead among the principal producing States. In this period there was considerable development of the tobacco industry in the Connecticut Valley.

In the decade ended in 1879 there was a considerable increase in production in nearly all the leading tobacco States, and for the first time production in Pennsylvania and Wisconsin became of importance. Production in Missouri reached its maximum in this period. During the decade ended in 1889 there was a further decided increase in average production for the country as a whole, although the 1889 crop itself was below the average, especially in Virginia. During this period Kentucky further increased her lead as

the principal producing State. There was also a considerable increase in production in Wisconsin. In the last decade of the past century there was a marked increase in the tobacco crop of nearly all leading States, but the outstanding features were the very large increase in North Carolina and the addition of South Carolina to the list of important producing States. Tobacco had ceased to be a crop of importance in Missouri. In the decade 1900-1909 there was a temporary period of decreased production in most of the principal tobacco States from 1904 to 1907, inclusive, while the crop of 1909 was very large, with the principal increases in Kentucky, Ohio, Tennessee, Indiana, the Connecticut Valley, and West Virginia. During the decade ended in 1919 there were further notable increases in production in North Carolina, South Carolina, Kentucky, Tennessee, Pennsylvania, and Connecticut. In 1918 the crop of Georgia began to increase considerably in size.

Differentiation into Distinctive Types.

The history of tobacco production in the United States has not been one of simple expansion, but rather, there has been throughout a tendency toward increased specialization. The use of tobacco for chewing and pipe smoking and in the forms of snuff, cigarettes, and cigars was prevalent among the natives when Columbus first visited America, but it is not clear whether these people recognized the special adaptability of different tobaccos for use in these different forms. At any rate, the early settlers in Virginia produced at first but a single fundamental type of tobacco for export to Europe, although this product soon came to be recognized as differing in its qualities from the tobaccos produced in the West Indies and South America by Spanish settlers. As its culture was carried from the first settlement at Jamestown into new territory it was seen that the changes in soil and climate resulted in important differences in the character of the tobacco produced. It gradually became more and more apparent also that these differences in the properties of the tobacco leaf due to soil and climatic influences greatly affected its adaptability for use in different forms, the product of one section, for example, being es-

pecially suitable for making smoking or chewing tobacco but perhaps not producing so acceptable a cigar as that of another section. It was learned, moreover, that desirable characteristics of the tobacco leaf resulting from local soil and climatic influences could be further accentuated by modifying the methods of growing and curing. Thus, through a process of gradual evolution tobacco culture has become highly specialized, each producing district furnishing a distinctive type of leaf especially adapted for certain uses, based ultimately on the tastes and preferences of the consumer. It is the accumulated experience of three centuries of tobacco culture that each of these types can be produced only under certain conditions of soil and climate, by using certain varieties of seed, and by employing special methods in growing and handling the crop.

Dark fire-cured and air-cured types.—The dark fire-cured types of to-day are fundamentally the same as the original Jamestown tobacco. The Indians taught the first settlers the use of open fires and smoke in curing the green tobacco leaves, and this method of curing, together with certain distinctive cultural practices adopted in the earliest days, is still followed. As tobacco culture was extended farther inland the modifications in character of leaf produced by the heavier, more clayey soils of the Piedmont region proved to be desirable, and as a consequence the culture decreased and was finally abandoned on the rich lowlands of the tidewater region originally employed. Thus the culture of this type was transferred to the uplands of the Piedmont section of Virginia. Fire curing also was practiced in southern Maryland in the earliest days, but later the process of air curing without the use of artificial heat was substituted there as well as in the upper counties of Virginia. The growing of these fire-cured and air-cured types was extended across the Alleghenies into eastern and southern Ohio, across Kentucky and northern Tennessee, and even beyond the Mississippi into Missouri, by pioneer settlers from Virginia and Maryland. From the beginning the dark fire-cured types have been distinctively export tobaccos, about 80 per cent of the total production going to foreign markets. The remainder is used mainly for snuff and for plug chewing. The dark air-cured types also always have been exported in

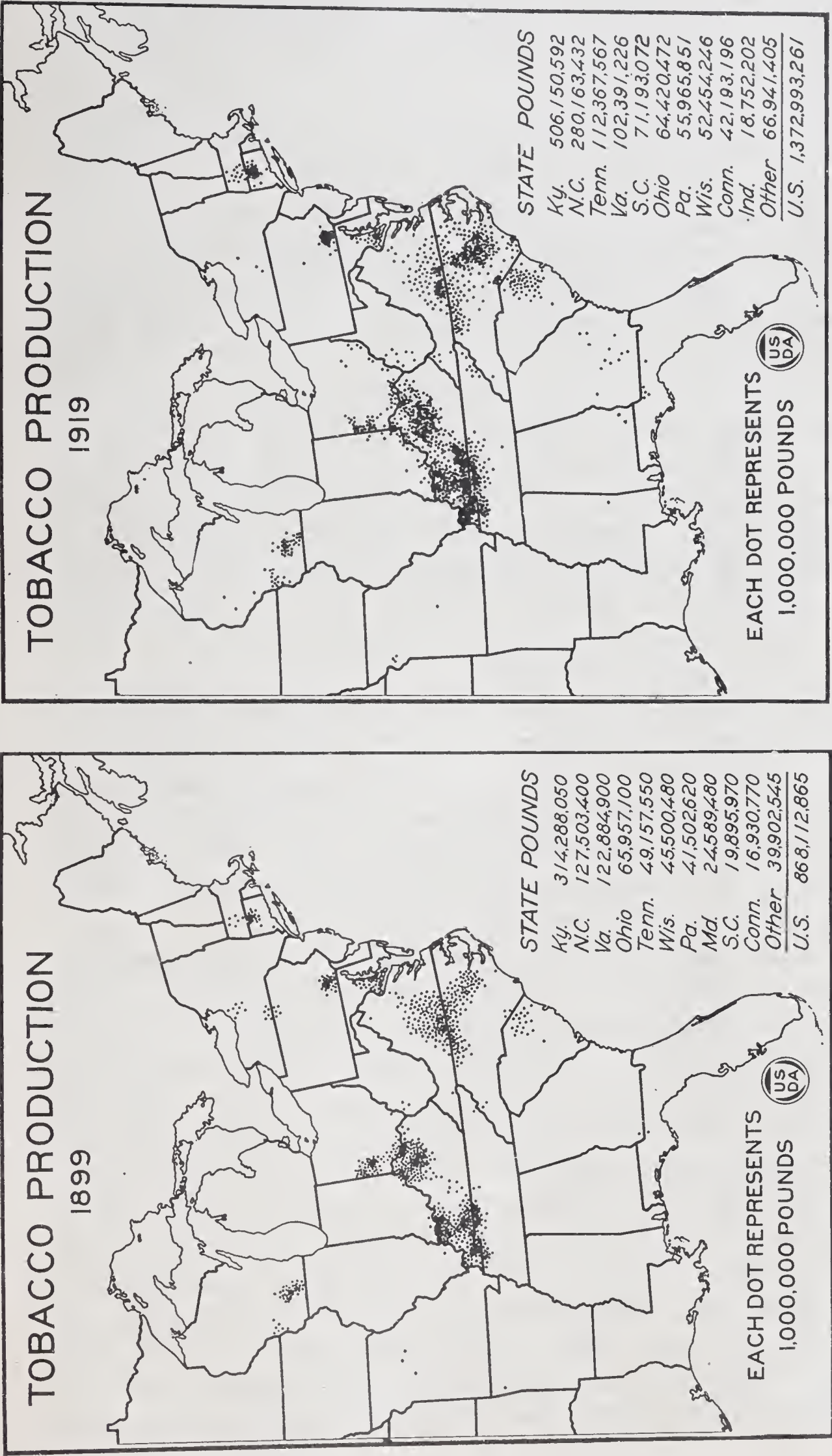


FIG. 6.—In the 10-year period ending with 1899 there was marked expansion in production in North Carolina to the eastward of the old producing district, this development extending also into eastern South Carolina. The crop of 1919 was very large, with principal increases in Kentucky, North Carolina, Tennessee, South Carolina, and Connecticut.

large quantities, but most of these types are far more important in the domestic manufacture of chewing tobaccos than are the fire-cured types.

// *Bright flue-cured tobacco.*—As the early colonists pushed tobacco culture into the central border counties connecting Virginia and North Carolina it was found that the light-gray, comparatively infertile lands of that section produced a light-colored sweet leaf, which soon became popular as a chewing tobacco. After the War of 1812 an active foreign demand for mild spangled tobacco stimulated the production of this new type. Less heat and smoke were required for this tobacco than for the darker, stronger types, and about 1825 charcoal began to be used in place of open wood fires in order to secure lighter colors. Soon after the Civil War the use of flues in curing was adopted, thereby further increasing the demand for this type in the manufacture of chewing and smoking tobaccos and causing rapid expansion in production in southern Virginia and the north-central portion of North Carolina. Beginning about 1890, there was very rapid development in the culture of bright flue-cured tobacco in the so-called new belt section of eastern North Carolina and South Carolina. During the past 15 years there has been further marked expansion in the production of bright flue-cured tobacco, and its culture has now been extended into southern Georgia. This type is chiefly used for the manufacture of chewing plug, granulated smoking mixtures, and cigarettes, and for export.

☞ *Cigar leaf.*—In 1810 the manufacture of cigars from tobacco imported from Cuba and Brazil began in a small way in Hartford County, Conn., and about 1825 it began to be recognized that the local conditions of soil and climate were adapted to the growing of cigar leaf. In 1833 the Maryland Broadleaf variety of tobacco was introduced and this marked the beginning of the extensive Broadleaf or Seedleaf tobacco industry which expanded rapidly about the middle of the last century not only in the Connecticut Valley but in Pennsylvania and in the Miami Valley of Ohio as well. Soon after the close of the Civil War the culture of cigar leaf rapidly developed in Wisconsin. About 1870 the so-called Havana Seed type of cigar leaf obtained from Cuba was introduced into the Connecticut

Valley, the Miami Valley of Ohio, and southern Wisconsin, and its culture developed rapidly in the next decade. During the past two decades there has been extensive development of the growing of cigar wrapper leaf under artificial shade in the Connecticut Valley and in the Quincy, Fla., district.

White Burley.—The extensive Burley industry owes its existence to the discovery of a new, distinctive variety of tobacco in Brown County, Ohio, in 1864. The great success of this variety in displacing the dark tobaccos which were grown at that time in north-central Kentucky and in counties of adjoining States along the Ohio River was due primarily to its special fitness for the manufacture of heavily sweetened plug for chewing. In recent years this type has found extensive use in the manufacture of cigarettes and smoking mixtures, and this has resulted in wider culture of the subvariety known as Stand-Up Burley.

Present Geographical Distribution, by Types.

Present localization of production of the principal types of tobacco is shown in Figure 7, except that areas in which production is scattering are not included. Cigar-leaf types are grown chiefly in the counties of Hampden, Hampshire, and Franklin, Mass.; Hartford, Tolland, Litchfield, and Middlesex, Conn.; Onondago, Chemung, and Steuben, N. Y.; Lancaster and York, Pa.; Darke, Miami, Montgomery, Preble, and Warren, Ohio; Dane, Rock, Vernon, Crawford, Columbia, and Trempealeau, Wis.; Gadsden, Fla.; and Decatur, Ga. The bright flue-cured type is grown chiefly in the southern tier of counties, Patrick, Henry, Pittsylvania, Halifax, and Mecklenburg, and the southern portions of Franklin, Charlotte, and Brunswick, in Virginia; the two upper tiers of counties of north-central North Carolina: including Surry and Yadkin to the west, and practically the entire eastern half of the State, excepting the immediate coast region; the counties of Marion, Horry, Dillon, Darlington, Florence, Lee, Sumter, Clarendon, and Williamsburg, S. C. There is a less concentrated production in several counties of southern Georgia, centering around and to the east of Coffee County. Burley is grown in the north-

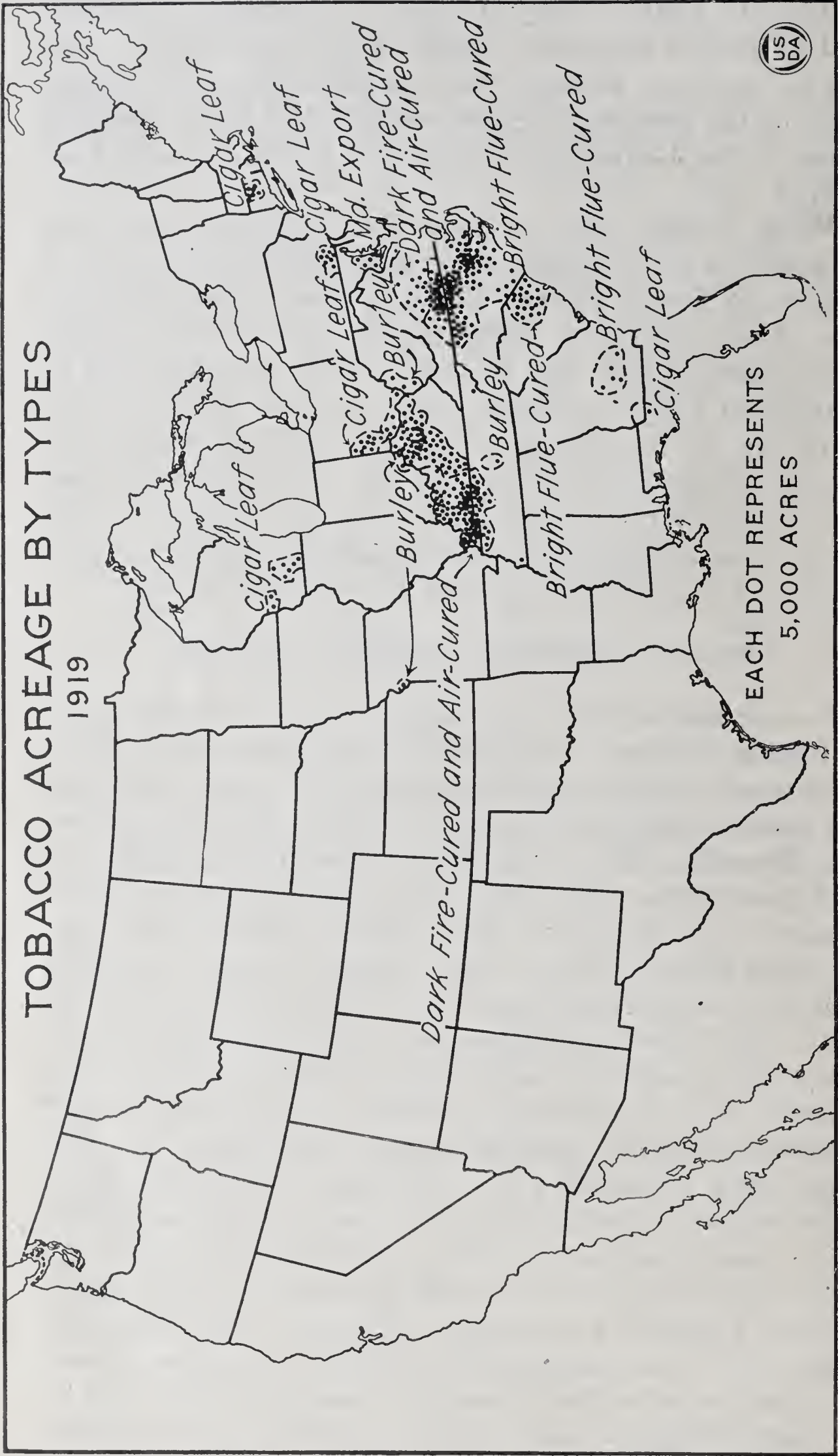


Fig. 7.—Each distinctive type of tobacco has its special requirements as to soil and climate and the present localization of production of the various types is the result of a long process of evolution and specialization.

central portion of Kentucky, including to the westward approximately the counties of Meade, Hardin, Hart, and Barren, and extending eastward as far as Greenup, Rowan, Powell, and Rock Castle; the counties of southeastern Indiana, southern Ohio, and westerly West Virginia which border on the Ohio River. Dark air-cured types are chiefly grown in Spencer and Warrick Counties, Ind.; the portion of Kentucky immediately westward of the Burley district and including, to the west, the counties of Daviess, McLean, Muhlenburg, Butler, Warren, and Simpson; the adjoining area of Tennessee, including the upper portion of Trousdale and Smith Counties; the counties of Caroline, Louisa, Hanover, Goochland, and a portion of Fluvanna, in Virginia, the latter section constituting the so-called Virginia sun-cured district. In addition, the counties of Prince Georges, Anne Arundel, Charles, Calvert, and St. Marys, in Maryland, produce a somewhat lighter-colored air-cured type. Dark fire-cured tobacco is produced in the portion of Kentucky to the west of the dark air-cured district, together with adjoining counties of Tennessee, including Houston, Dickson, Cheatham, but not Lake and Benton; the section of Virginia between the sun-cured and bright flue-cured districts and extending westward to the Blue Ridge Mountains.

Factors Influencing Tobacco Production.

Production of Leading Types of Tobacco.

To arrive at a proper understanding of the significance of the increase in total production shown in Figure 2 it is necessary to examine the trend of production in the different types of tobacco. The annual production of the leading types for the years 1909–1921, inclusive, is shown in Figure 8. To facilitate comparison the several subtypes of dark fire cured and dark air cured are treated as a single group, since, for the most part, they are closely related. In this group are included (1) the fire-cured tobaccos of Virginia and the Clarksville and Hopkinsville, the Henderson, and the Paducah districts of Kentucky and Tennessee; (2) the air-cured tobaccos of the one sucker district of Kentucky, Tennessee, and Indiana, the so-called Virginia sun-cured district, and the Maryland and eastern Ohio export district.

It is quite apparent that for the period covered the aggregate production of cigar leaf has remained in a relatively stable position, even the general disturbance of the World War having had only a moderate influence on the production of this type. The average production was about 205,000,000 pounds during the five-year period 1909–1913 and 229,000,000 pounds in 1917–1921. The combined dark fire-cured and air-cured types also do not show any significant change of a permanent character, although there are rather wide periodic fluctuations. Average production for 1909–1913 was 350,000,000 pounds, and for 1917–1921 the average was 380,000,000 pounds.

The production of Burley shows a well-defined upward trend, the average for 1909–1913 being 215,000,000 pounds

TYPES OF TOBACCO: PRODUCTION, 1909–1921.

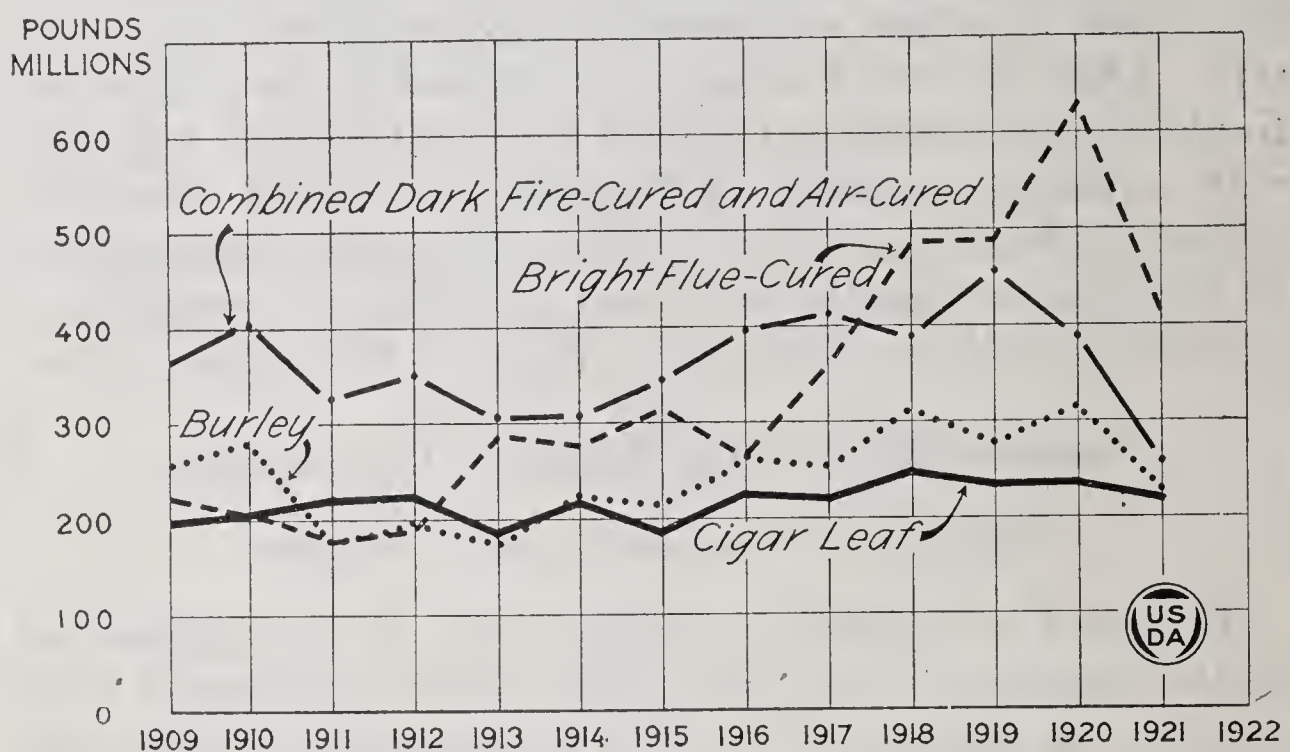


FIG. 8.—The bright flue-cured or cigarette type shows a remarkable increase in production in recent years and there has been an upward trend in the production of Burley. Production of the dark fire-cured and air-cured types and cigar leaf has become relatively stabilized.

as against 275,000,000 pounds for the period 1917–1921. The most striking fact brought out in Figure 8 is the remarkable increase in production of bright flue cured, the increase for the past 10 years being more than 100 per cent. For the years 1909–1913 the average was 215,000,000, while for the years 1917–1921 the average was 475,000,000. The sharp rise in total production of tobacco since 1913 (Fig. 2), therefore, is to be found chiefly in a moderate increase in the production of Burley and a very large increase in bright

flue cured. The causes for these differences in trend of production of the different types will be found in the discussion of exports and of consumption (pp. 448 and 450). Curtailment of tobacco production in foreign countries and increased domestic and foreign demand for American tobacco during and immediately after the World War, with resultant high prices, are reflected in some degree of increase in production of all types. In 1921 there was a marked reduction in production of all types except cigar leaf, which was less affected than other tobaccos by the postwar readjustment.

Position of Tobacco in the Farming System.

Tobacco is grown as a cash crop and has a relatively high value per acre. The average tobacco acreage per farm does not vary widely over the country, running 4 to 5 acres in the principal producing districts, with the exception of the highly specialized cigar-wrapper district of New England. In the latter district the acreage is about 8 acres for each tobacco farm, as reported in the 1919 census.

The same returns indicate that the tobacco acreage represents roughly 11 per cent of the total improved land on tobacco farms in Virginia, 17 per cent in North Carolina, and 8 per cent in Kentucky, while in Connecticut the tobacco acreage reaches 28 per cent of the improved land on the tobacco farms.

The labor requirements for tobacco culture are large, especially at certain seasons of the year, and this is an important factor in determining the tobacco acreage on the individual farms. While not all land on the average farm may be equally adapted to tobacco culture, the above facts indicate possibilities for large expansion if demand and prices should justify the shifting of labor and land from other crops to tobacco.

Sharply contrasting systems of cropping tobacco lands are found in different regions, and it is of considerable interest and importance to inquire into the effects of these contrasting cropping systems on the trend of acre-yields of tobacco. The tobacco-producing districts of Connecticut, Pennsylvania, Maryland, and North Carolina, representing two

regions of high yields and two of low yields, afford typical examples of these different cropping systems. In Connecticut tobacco is grown mostly on light sandy and sandy loam soils, which are not naturally fertile. Since the size of the average farm is quite small, tobacco ordinarily must be grown each year on the same land. In this instance rapid development of the plant to large size is essential for success, and to accomplish this result resort is made to exceedingly heavy applications of commercial fertilizers and liberal use of barnyard manure and lime. The immediate effect of this highly intensive one-crop system, together with favorable climatic conditions, has been to give large and increasing yields, but it is significant that in recent years the yield has been steadily declining. (Fig. 9.) It is known that this decline in yield is due, at least in part, to the appearance of root diseases of tobacco as an incident of the cropping system employed. The high yields of the Lancaster, Pa., district are obtained under a wholly different farming system. The tobacco soils, which are mainly much heavier than those of the Connecticut Valley, are better adapted to diversified farming, and only a small portion of the total acreage is in tobacco each year. A well-balanced cropping system is prac-

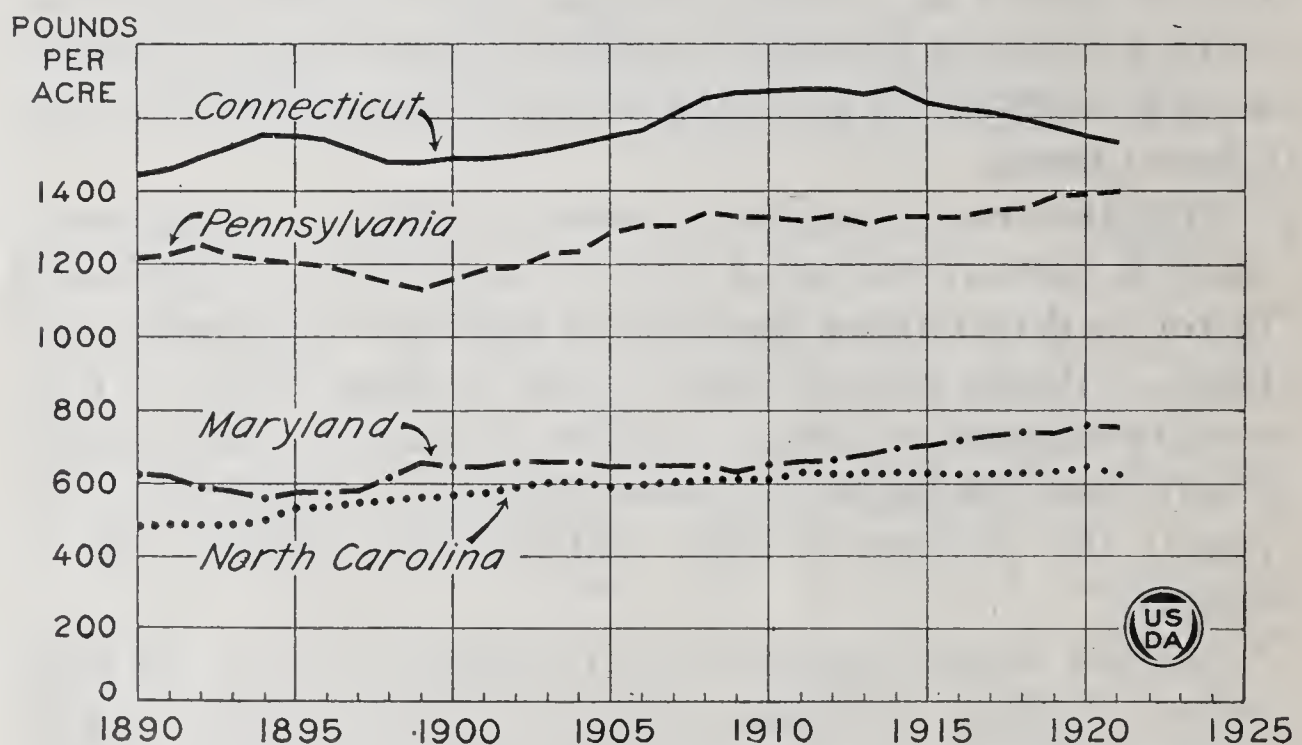


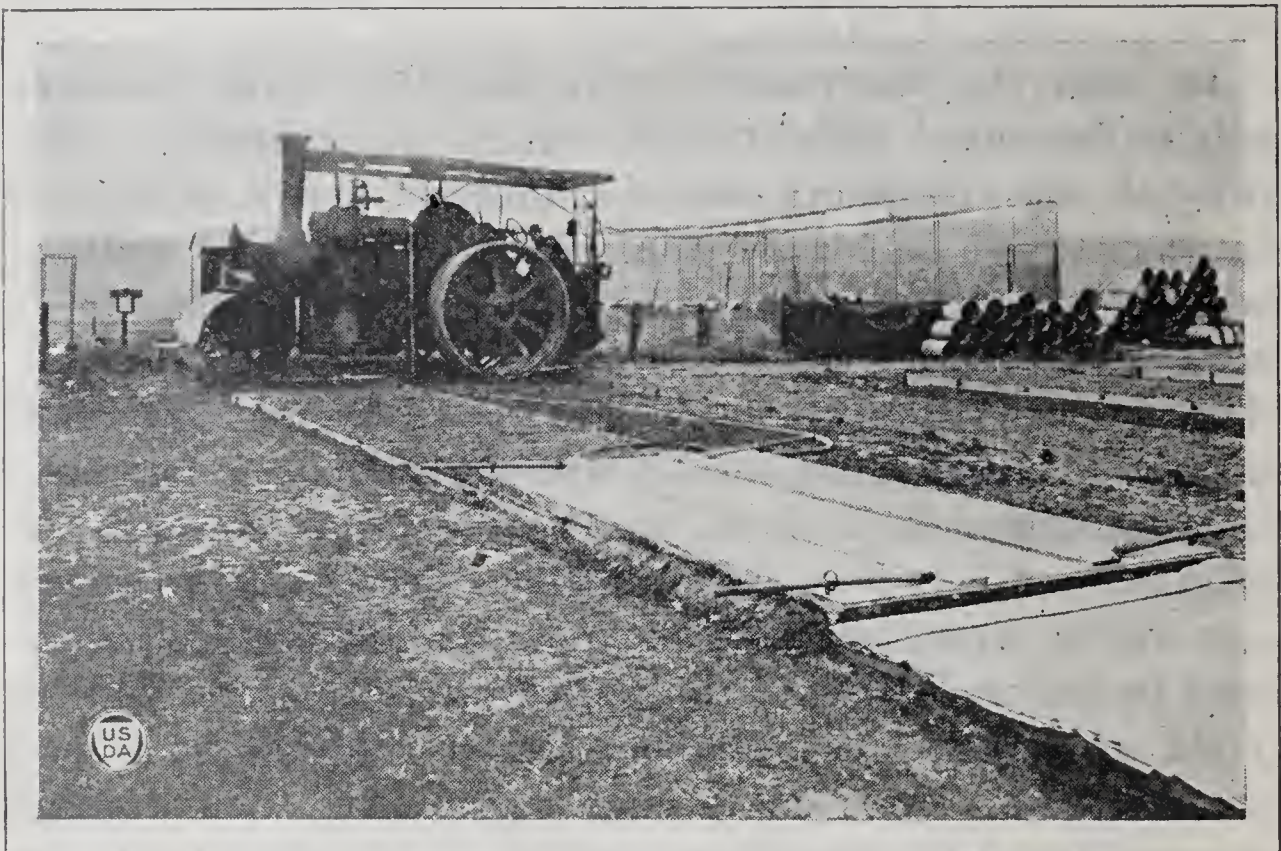
FIG. 9.—Under an extensive system of culture on soils of medium fertility yields are being successfully maintained in Maryland and North Carolina, though at low levels; in Pennsylvania a diversified, intensive system is maintaining yields at a high level, while in Connecticut a highly intensive one-crop system apparently is failing to do so.

ticed, which includes the growing of wheat, grass and clover, and corn in rotation with tobacco. The winter feeding of steers is an important feature of the system, since it utilizes on the farm the straw, hay, and grain produced and provides the manure needed for maintaining soil productiveness. This cropping system, moreover, provides a fair distribution of labor through the year. Figure 9 discloses the fact that under the Lancaster system there has been since 1899 a decided upward trend in yield, thus indicating the soundness of this system of tobacco culture.

In both the Maryland export and the North Carolina bright flue-cured districts soils which are naturally rather infertile are commonly used for tobacco, and it is difficult to secure high yields by application of intensive methods without sacrificing quality of product. In Maryland much land available for tobacco culture remains untilled each year. The prevailing practice has been to grow two or more crops of tobacco on the land, mostly without manure or fertilizer, in some instances with an intervening crop of wheat. A crop of corn may then follow, after which the land remains idle for a period of years in order that its productiveness may be restored. Under this system of resting the land the yield of tobacco has remained almost constant at a level somewhat less than 700 pounds, apparently with a slight upward trend in recent years, which is probably due to use of more fertilizer and better varieties of tobacco. In the North Carolina tobacco district there is no systematic rotation of crops as a general practice. The rule has been an alternation of continuous cropping to tobacco and resting the land for one or more years, thus resembling the practice in Maryland. As the old practice of constantly clearing new land for tobacco decreased it became necessary to rely more largely on commercial fertilizers, for resting the exhausted soils for short periods in itself is not sufficient to restore productiveness. Fertilizers are much more generally and more liberally used than in Maryland. During the earlier portion of the period covered (Fig. 9) there was an upward trend in yield, probably due to increased use of fertilizer, and since that time the acre yield has remained quite stationary.

Influence of Soil and Climate on the Quality of Tobacco.

Probably no other crop is so greatly affected in quality by soil and climate as is tobacco. Climate is a factor of importance in the general distribution of tobacco culture in the United States and affects especially the quality of the crop. The general tendency in northern latitudes is toward the production of a large, relatively thin leaf, without pronounced aroma. Thus northern climatic conditions favor



STEAM STERILIZATION OF TOBACCO SEED BEDS.

FIG. 10.—Sterilizing tobacco seeds with high-pressure steam has recently come into wide use in northern tobacco-growing districts and is adapted to all sections. This process is an important aid in controlling both diseases and weeds in the seed bed.

the production of cigar types possessing these leaf characteristics of large size, thinness, and weak aroma. In southern districts the tendency is toward the production of a somewhat smaller, more aromatic leaf of heavier body, as seen in the cigarette, pipe-smoking, chewing, and export types.

The physical and chemical properties of the soil, however, undoubtedly constitute the most potent factor in influencing the development of those properties of the leaf which determine its usefulness in the trade. Both the surface soil and the subsoil are of importance in this particular. In gen-

eral, light sandy and sandy loam soils of low water-holding capacity and low content of soluble mineral matter tend to produce a thin leaf of relatively large size, light in color and body, fine texture, and weak aroma. Heavier soils, containing more silt and clay, tend to produce a leaf of small size, dark color, heavy body, and strong aroma. So pronounced and important is the influence of soil on the quality of tobacco that commonly certain restricted localities within the principal producing districts enjoy a high reputation



TRANSPLANTING TOBACCO BY MACHINE.

FIG. 11.—The machine transplanter, which is widely used in the Cigar-leaf and Burley districts, saves labor and insures a better stand, particularly in dry weather. It is not adapted for very small fields or where the land is uneven.

for the special merit of their tobacco. In the present state of our knowledge of the subject, however, it is not possible to analyze fully the remarkable influence of these seemingly slight differences in soil on the quality of the tobacco produced.

The cigar wrapper and binder types of the Connecticut Valley and of the Quincy, Fla., districts are grown on sandy and sandy loam soils containing but little clay in the sub-

soil and having a low water-holding capacity. The cigar binder-leaf soils of Wisconsin are sandy loams, loams and light clay loams, while the cigar-filler soils of Pennsylvania and Ohio are silt and clay loams, the Pennsylvania soils being largely of limestone origin. The filler soils are considerably heavier and have a higher water-holding capacity than the binder-leaf soils. Burley attains its highest development on the highly fertile phosphatic limestone soils of the bluegrass region of Kentucky and in southern Ohio. The dark fire-cured and air-cured tobaccos of Kentucky, Tennessee, and Virginia are grown largely on heavy silt and clay loams having a high water-holding capacity. The flue-cured type is grown on gray sandy and sandy loam soils of low natural fertility. The body and texture of the flue-cured leaf depend largely on the texture of the subsoil on which it is grown. The cigarette and granulated pipe-smoking grades are obtained chiefly on the lighter soils with but little clay in the subsoil, while the plug-filler and wrapper grades are obtained on somewhat heavier soils with more clay in the subsoil.



CULTURE OF CIGAR WRAPPER TOBACCO UNDER ARTIFICIAL SHADE.

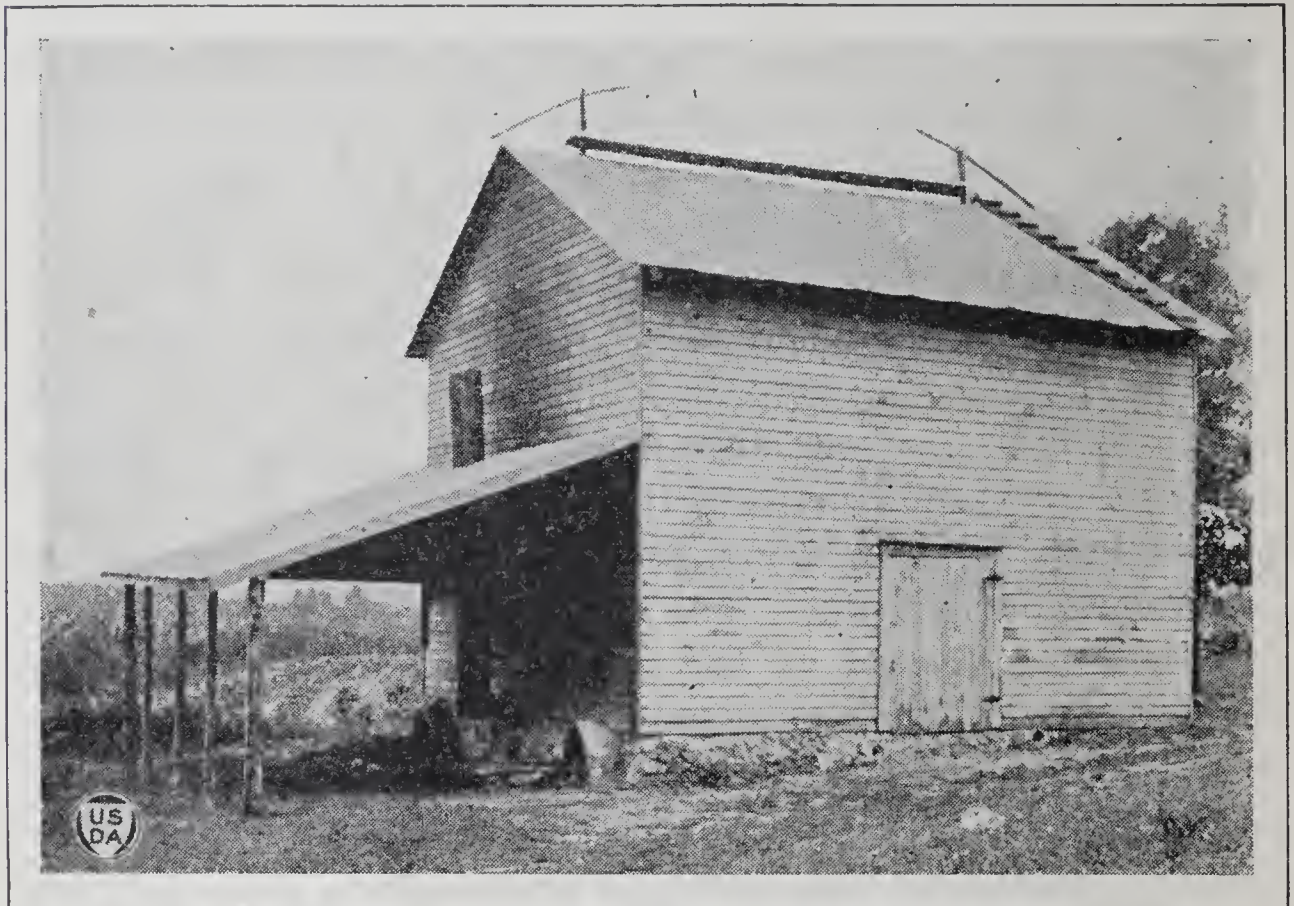
FIG. 12.—The growing of high-grade cigar wrapper leaf from Cuban seed under an artificial shade of cheese cloth or of slats is an outstanding recent development of cigar tobacco production. The field covered with cloth here shown is $1\frac{1}{2}$ miles long.

Effect of Seasonal Conditions on Quality and Yield.

As a rule the best quality of tobacco in conjunction with satisfactory yields is obtained when seasonal conditions are such as to cause rapid, uninterrupted growth of the plant. Among the chief requirements are fairly high temperatures and a moderate, evenly distributed rainfall. The tobacco plant is not readily killed by drought, but quickly succumbs to a water-logging of the soil. A comparatively dry season tends to reduce the size of the plant as a whole and that of the individual leaves on the plant, and to produce an abnormally thick leaf of close grain, containing an excess of gum and having poor combustibility. The yield of such a crop is greater than would be indicated by the size of the plant, and the leaf is resistant to decay in the processes of fermenting and aging. A comparatively wet season, on the other hand, tends to produce large growth and thin, tender leaves, deficient in gummy matter, having free burning properties, but susceptible to injury through decay in the processes of curing and fermenting. The yield of such a crop is usually below that indicated by the size of the plant. Tobacco in the green state is seriously damaged by killing frost or freezing temperatures, and there is always the possibility of partial or total loss from early frost in northern regions. Tobacco is peculiarly susceptible to great injury from hail and wind storms, and locally there are important losses from these causes each year.

A study of the correlation of weather and yield of tobacco in Ohio and Kentucky extending over a long period of years indicates that for best yields in tobacco districts of the Ohio Valley the weather conditions as compared with the normal climate in that region should be as follows: May should be moderately dry for a good seed bed, and cool to harden the tobacco plants. June should be moderately warm and wet to insure growth when the plants are set out, although the warm and wet weather may develop injurious parasitic diseases. July rainfall and temperature should be about normal, as too much rain interferes with cultivation; and if the rainfall is inadequate, the temperature should be below the normal. August should have rain enough to produce a good-sized leaf after topping,

/ Warm and wet weather makes the best growth, but is more likely to cause the development of leaf spot. Hot and dry weather is very detrimental; hence if the rainfall is less than normal the month should be cool. If the growing season is moderately wet, with a uniform supply of moisture, the best growth will be with the temperature somewhat above normal. But if drought prevails or frequently oc-



MODERN BARN FOR FLUE CURING.

FIG. 13.—These barns are of small size and are provided with a system of flues for regulating temperature by radiant heat. Ventilators are provided at the base and top of barn. This system of curing is used in the bright flue-cured or cigarette tobacco districts.

curs, the best results are obtained with the summer somewhat cooler than normal. /

Importance of Fertilizers.

// A large portion of the tobacco crop is produced on soils which are naturally rather infertile, while the tobacco plant requires a fairly generous supply of plant nutrients if it is to obtain proper growth, hence the necessity for extensive use of fertilizers. Moreover, the acre value of tobacco is sufficiently high to justify considerable expenditure for fertilizers. The rational use of fertilizers in tobacco culture is a complicated problem because of the marked effect which

they may have on the quality of the tobacco produced. Again, these effects of fertilizers on the quality of the tobacco are materially modified by fluctuations in seasonal conditions, especially in amount of rainfall, thus making more difficult the problem of selecting the proper fertilizer. It is frequently profitable to apply fertilizers to the tobacco crop at rates considerably in excess of the immediate requirements of the tobacco itself, thus providing for an important residual effect on other crops following in the rotation which in themselves would not have a sufficiently high acre value to warrant their receiving direct application of the necessary fertilizer.

The best Burley soils of Kentucky and adjoining States are highly productive, and on such soils, properly handled, it is not ordinarily necessary to apply commercial fertilizers to the tobacco crop. In Pennsylvania and Wisconsin barnyard manure is widely used in lieu of commercial fertilizers, while in the Connecticut Valley both manure and fertilizers are commonly used. In nearly all remaining tobacco-growing districts much reliance is placed in commercial fertilizers. This is particularly true of the bright flue-cured districts. The rate of applying fertilizers ranges from 1 to 2 tons per acre in the Connecticut Valley, 600 to 1,000 pounds in the bright flue-cured district and the cigar-tobacco district of Ohio, and 300 to 500 pounds in most of the dark fire-cured and air-cured districts.

The so-called complete fertilizers are commonly used, but their composition varies very widely in different localities. Cigar tobaccos require rather heavy applications of nitrogen, while the dark fire-cured and air-cured types and Burley require somewhat lower percentages of this element in the fertilizer. For bright flue-cured leaf only the minimum quantity of fertilizer nitrogen required for proper growth of the plant is used. Phosphoric acid is usually applied in quantities in excess of actual requirements for growth in order to promote proper ripening. Liberal applications of potash are usually profitable because of favorable action on the quality of the tobacco. Under certain conditions magnesia is an important constituent of the fertilizer. Lime may be beneficial or injurious, depending on soil conditions and the type of tobacco.

Yield Per Acre in Relation to Quality of Product.

A characteristic feature of tobacco culture is that the returns per acre to the grower commonly depend quite as much or even more on the quality of the leaf than on the yield obtained because of the very wide range in prices for the different grades of leaf. The highest returns are usually derived from maximum yields of the finer grades of leaf rather than from maximum total yields. In some types, such as most cigar tobaccos and dark fire-cured and air-cured leaf, moderately high yields are commonly asso-



FIG. 14.—TOBACCO HORNWORM.

ciated with high quality, but this is not true of some other types. In the case of bright flue-cured, now the world's leading type, high quality of product is conditioned in such way by the physical and chemical properties of the soil that high yields are sel-

dom associated with best quality. In substantially all types rank, coarse growth is incompatible with high quality and therefore with maximum returns per acre. For these reasons highly intensive methods involving enrichment of the soil are applicable to tobacco culture only under certain conditions and limitations.

Insects Affecting Tobacco.

By far the most serious insect pests of tobacco in the United States are the hornworms, *Phlegethontius quinque-maculata* (northern tobacco worm), and *P. sexta* (southern tobacco worm). The hornworms feed voraciously upon growing tobacco leaves and grow to a large size. They may be controlled by dusting with powdered arsenate of lead.

In the shade-grown tobacco fields of Georgia and Florida damage by the tobacco budworm, *Chloridea virescens*, is of primary importance. The eggs are deposited in the buds of the plant, and a single larva may eat through several leaves. As the leaves grow larger the holes likewise become larger, and the leaves are rendered unfit for wrappers. For control, apply arsenate of lead and corn meal (1 pound of arsenate of lead to 75 pounds of corn meal) to the buds twice a week until the plants are topped.



FIG. 15.—TOBACCO BUDWORM, ADULT FORM.

The tobacco flea beetle (Fig. 16), *Epitrix parvula*, attacks plant beds and young plants in the field and frequently injures tobacco until it is carried to the barn. The leaves are riddled with holes, and frequently young plants are killed outright. Apply arsenate of lead or Paris green.

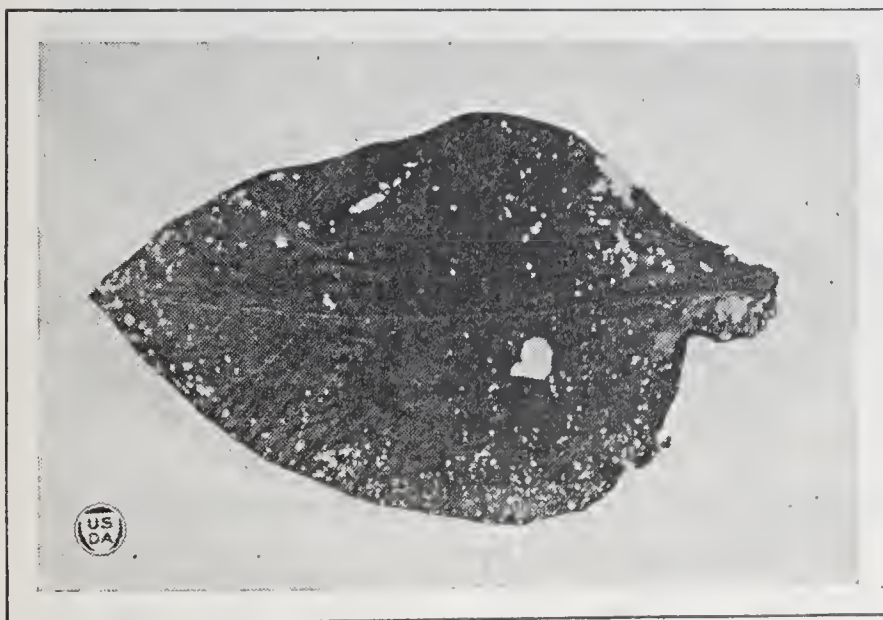


FIG. 16.—INJURY FROM TOBACCO FLEA BEETLE.

Very serious injury to stored and manufactured tobacco is caused by the tobacco beetle, *Lasioderma serricorne*.

Other insects which injure the growing crop are cutworms, splitworms, tobacco thrips, several species of grasshoppers, and other minor pests.

Very serious injury to stored and manufactured tobacco is caused by the tobacco beetle, *Lasioderma serricorne*.

Diseases of Tobacco.

The tobacco plant is subject to a number of diseases, some of which are very important factors in lowering yield per

acre, while others reduce the value of the leaf through rendering it unsuitable for the purpose for which it was intended. The main diseases which are concerned in lowering production are the root rots. These diseases are not so evident to the growers as are the leaf diseases, but in the aggregate they cause average annual losses running into millions of dollars. Some progress is being made in the control of these troubles through development of resistant strains, crop rotation, and better understanding of the nature of these diseases. The wilt diseases, bacterial wilt and *Fusarium* wilt, have not become widespread in this country and are quite satisfactorily controlled by crop rotation. The mosaic disease, long known in tobacco in this country but usually



**WILDFIRE (BACTERIUM TABACUM) ON WISCONSIN
BINDER LEAF.**

FIG. 17.—Showing characteristic symptoms of the disease. This leaf spot disease has caused serious damage in various sections in recent years.

not causing much concern, seems to be increasing in economic importance. It is not uncommon to see large acreages of tobacco very materially reduced in yield and quality by this disease. Primary infection seems in most cases to start in the seed beds. While a considerable number of leaf-spot diseases due to various causes occur on tobacco, the disease known as "wildfire" has recently caused most concern

among the growers. This disease, first definitely known to occur in 1917 in North Carolina, has since spread to practically all tobacco-growing districts of the United States. While this disease, like most other plant diseases, is very largely dependent upon weather conditions for its development to a serious extent, its range of activity in this respect is sufficiently wide to make its occurrence in any field in any year a serious menace to the crop. The disease, in all certain cases known to date, originates in the seed bed, and transplanting of infected plants should therefore be carefully avoided. Another disease of recent introduction to this country is known as blue mold. This disease occurred very generally in the seed beds in the Florida-Georgia district in 1921, but did not cause serious damage to the final crop, and apparently did not reoccur in 1922.

Cost of Production.

Tobacco is the most intensive annual farm crop grown on any considerable acreage. The amount and distribution of labor, wages paid to labor, and other items of cost vary greatly in the production of different types of tobacco. A considerable proportion of the total acreage and production of tobacco is grown on relatively cheap land, with low-priced labor. In regions where the growing of a particular type of tobacco has been profitable land values and other costs, particularly wages paid to labor, have increased. These increases have resulted in an increase in the cost of growing an acre and a pound of tobacco. In other words, variations in the prices of different cost items have had greater effect on total cost of production than changes in the amounts of the items. Within a region cost studies furnish basic data for estimating the cost of a crop. Individual cost figures furnish the tobacco grower with definite information regarding the amount received for his own labor when marketed in the form of tobacco. Producers have a definite basis for determining to what extent it is desirable to use hired labor in the production of tobacco.

Distribution of Cost.¹

The principal items of cost in tobacco production are man and horse labor, land rent, and cost of upkeep and maintenance of the tobacco barns. These combined costs averaged from 75 to 93 per cent of the total costs in the three districts under discussion. Of these, man and horse labor was greatest, averaging from 45 to 65 per cent of the total cost. In 1920 the cost of the man labor was \$113 per acre in the Burley area, \$64 in the dark fire-cured area, and \$67 in the Georgia bright area (Fig. 18). This difference in cost per acre was

**DISTRIBUTION OF COST OF PRODUCTION, THREE
TOBACCO DISTRICTS, 1920.**

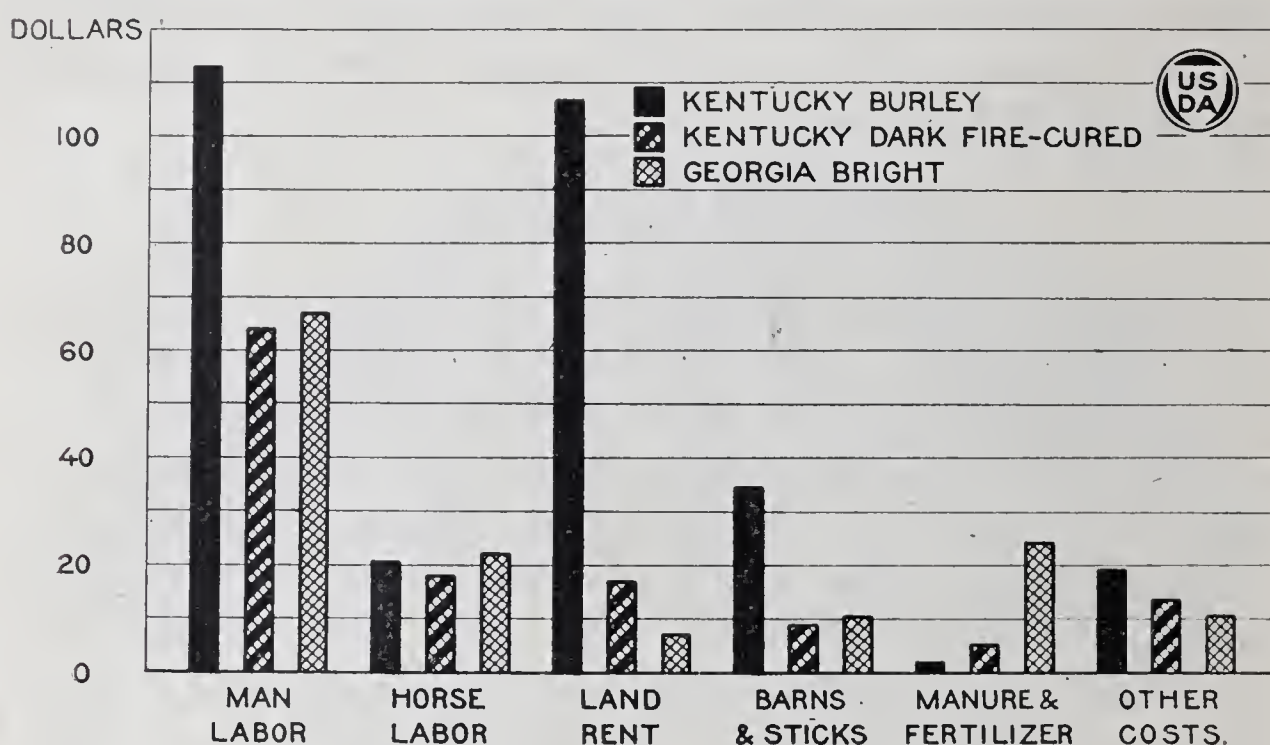


FIG. 18.—Variations in the items of cost in growing an acre of tobacco in the Kentucky Burley, Kentucky dark fire-cured, and Georgia bright flue-cured districts for 1920. Costs of man labor, land rent, and curing barns were relatively high in the Burley district, while the cost of fertilizer was relatively high in the Georgia flue-cured district.

due less to variations in the amounts of labor than in the wages paid. The average rate per day paid for man labor

¹ The following data on Georgia bright tobacco are for the 1920 crop and are taken from a study of the cost of producing bright tobacco in south-central Georgia by the Georgia Agricultural College, cooperating with the United States Department of Agriculture. For complete report consult Bulletin 250, Georgia Agricultural College, Athens, Ga.

In Kentucky a four-year study of the cost of producing Burley and dark fire-cured tobacco was begun in 1919 and was completed in 1922. The Burley cost figures were obtained near Lexington and the dark fire-cured figures near Hopkinsville. This work was done by the University of Kentucky, cooperating with the United States Department of Agriculture. Bulletin 229, for the crop of 1919, and preliminary reports for succeeding crops have been issued by the Kentucky Agricultural Experiment Station, University of Kentucky, Lexington, Ky.

was \$3.44 in the Burley area, \$2.58 in the dark fire-cured area, and \$1.67 in the Georgia area. The horse-labor cost for each area varied slightly with regard to cost per day and total days required. As an item of cost horse labor was of relatively more importance in the Georgia bright-tobacco area, where it was 16 per cent of the total cost, as compared to 7 and 14 per cent in the Kentucky Burley and dark fire-cured areas.

Distribution of Labor.

The amounts of man and horse labor required to grow and market an acre of tobacco vary considerably with regard

DISTRIBUTION OF LABOR IN GROWING OF TOBACCO, THREE PRODUCING DISTRICTS.

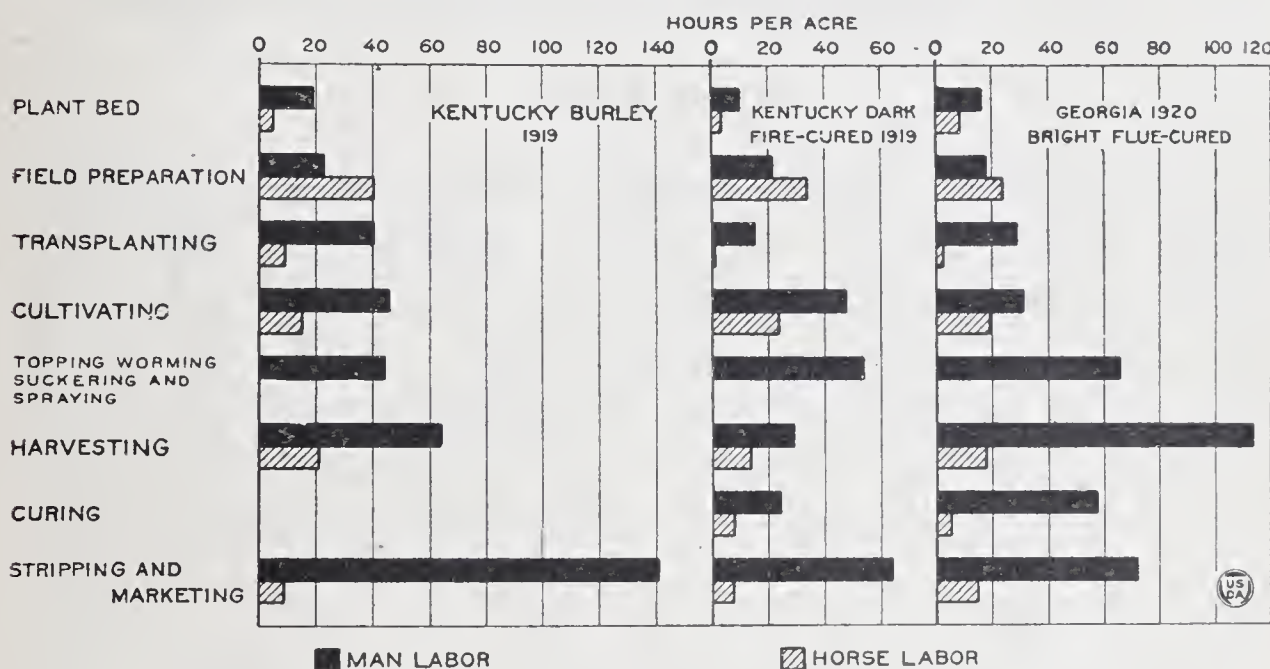


FIG. 19.—Distribution by districts of man and horse hours required to grow an acre of tobacco. Differences in methods of growing and handling the crop cause rather wide variations in labor requirements, especially in harvesting, curing, stripping, and marketing in the different districts.

to type. Records from the three areas under discussion indicate that an average of 262 hours of man labor were required to produce an acre of Kentucky dark fire-cured tobacco, 375 hours to produce an acre of Burley tobacco, and 403 hours for the production of an acre of Georgia bright tobacco. The amount of horse labor required per acre was found to be 89 hours in the dark fire-cured area, 98 hours in the Burley area, and 90 hours in the Georgia bright area.

The chief variations in labor requirements are found in harvesting, curing, stripping, and marketing. (Fig. 19.) In Georgia the leaves are pulled from the stalk, while in both Kentucky areas the tobacco plant is cut. Pulling or

priming requires a greater amount of labor than cutting, as in the former case the field must be gone over several times. In Georgia curing tobacco required an average of 59 hours of man labor per acre. In the Kentucky dark fire-cured area 24 hours were required per acre, while in the Burley area, where tobacco is air cured, the labor requirement for curing was negligible. Preparing for market and marketing the crop required about 38 per cent of the total man labor in the Burley area, which was considerably more than required by any other operation. In the Kentucky dark fire-cured area about 25 per cent of the total labor was for stripping and marketing. In the Georgia bright area, where the tobacco is picked, only 18 per cent of the total labor was for preparing and hauling the crop to market.

Land Rent.

The Kentucky Burley tobacco area is in the limestone region of the State. This land is high priced, especially when compared with the tobacco land in the Kentucky dark fire-cured and the Georgia bright areas. In 1920 the use of land in the Kentucky areas as determined by its cash rental value averaged \$107 per acre in the Burley area and \$17 in the dark fire-cured area. In the Georgia bright area the rental charge was figured at 10 per cent of the land value and amounted to \$7.20 per acre. (Fig. 18.) While undoubtedly land rents are lower now, especially in the Burley area, these figures reflect somewhat the rental value of the land in the three areas as measured by the type of tobacco grown and by the amount and quality of yield per acre. In the Burley area land rent was 34 per cent of total cost, in the dark fire-cured area 18 per cent, and in the Georgia bright area 5 per cent.

Barns and Sticks.

The average cost of maintenance, depreciation, and interest on investment in barns and sticks varied from 7 to 10 per cent of the total cost of producing tobacco in these areas. In Georgia relatively small tobacco barns are required. They are constructed principally of logs and fitted with fire boxes and flues. The flues are short lived, and the fire boxes

require constant repairs, which add materially to the cost of upkeep. In the Burley area the barns are well built and are larger and more expensive than in the Georgia area. Burley tobacco is an air-cured type and requires greater space and better ventilation, so that the barns must be relatively large. In the dark fire-cured area of Kentucky the barns are similar to those in the Georgia area, with the exception that flues and fire boxes are not used. The tobacco sticks are sometimes produced on the farm and sometimes purchased. A charge for sticks for each region is included in the total barn charge.

Fertilizers.

The records indicate that in both Kentucky areas very little expense was incurred for commercial fertilizer and barnyard manure. During the relatively high prices of 1920 the cost for commercial fertilizer and manure averaged less than \$2 per acre in the Burley area and slightly over \$5 per acre in the dark fire-cured area. (Fig. 18.) In Georgia bright tobacco is grown on thin sandy soil and requires a large amount of complete commercial fertilizer. Very little barnyard manure is used in this area, as its use tends to produce a rough, coarse plant. During 1920 the average application of fertilizer in the Georgia bright-tobacco area cost slightly over \$24 per acre. Fertilizer costs constituted 1 per cent of the total cost in the Burley area, 4 per cent in the fire-cured area, and 17 per cent in the Georgia bright area.

Other Costs.

These costs are made up of machinery, insurance, a charge for hiring a tobacco demonstrator, and miscellaneous cash costs.

Tobacco farms as a rule have a relatively small investment in machinery. Tobacco-transplanting machines were used to a limited extent in each area and represent a considerable part of the machinery charge. Including interest, depreciation, and repairs, the machinery cost averaged only 1 to 2 per cent of the total cost of producing tobacco in 1920.

In both Kentucky areas a charge for hail and fire insurance was made for each farm. The rate used in calculating this charge was determined from the farms having an actual cash

cost for such risks. This item represents from 4 to 5 per cent of the total cost of tobacco production in these districts. In the Georgia area no charge was made for hail and fire insurance.

Miscellaneous costs are made up of minor items, such as canvas, spray material, wood or coal for bed preparation and curing, and small cash payments for plants or tobacco seed. While these items are absolutely necessary in the production of the crop, they represent a relatively small proportion of the total cost of growing an acre of tobacco and averaged from 2 to 3 per cent of the total costs in the various areas.

In the Georgia bright-tobacco area an experienced tobacco man was hired for 1920 to instruct the farmers in methods of growing and handling the crop. Such men were hired by only a part of the farmers included in this study. In certain instances the demonstrator received 10 per cent of the net receipts from the tobacco crop after deducting warehouse charges, in other cases a flat rate of \$8 per acre was paid for his assistance. The average for all farms in 1920 was \$5.15 per acre, which was about 4 per cent of the total cost of growing the crop.

Relation of Yield to Cost.

Costs vary not only on different tobacco farms for a particular season, but also on the same farm from year to year. Such variations may be due to unfavorable weather, to diseases, to insect pests, or to the management of the operator. Variations in the cost of producing a pound of tobacco are due to variations in the cost expended per acre and in the yield obtained. A grouping of the tobacco records according to an increase in yield per acre shows that the cost per acre increased with yield and the cost per pound decreased. (Fig. 20.) It was found that in the Kentucky Burley area for 1919 the farms producing from 600 to 1,000 pounds per acre had an average cost of \$237 per acre and 30 cents per pound, while those that yielded over 1,500 pounds per acre (averaging 1,580 pounds) produced at a cost of \$330 per acre and 24 cents per pound. In the Kentucky dark fire-cured area cost increased from \$118 per acre for the farms having an average yield of 393 pounds to \$136

for the farms averaging 1,306 pounds per acre, but the cost per pound for the low-yielding group was 30 cents as compared to 10.5 cents for the high-yielding group. It must be remembered, however, that a rank, coarse growth is quite often associated with poor quality and low returns per pound. Therefore a reduction in cost per pound through larger yields should not be encouraged to the extent of sacrificing the quality.

Financing Tobacco Production.

Tobacco is a cash crop of high acre value, requiring much hand labor but little machinery, and therefore is well adapted to a tenancy system. In some northern tobacco-

RELATION OF YIELD PER ACRE TO COST OF PRODUCTION, THREE TOBACCO DISTRICTS.

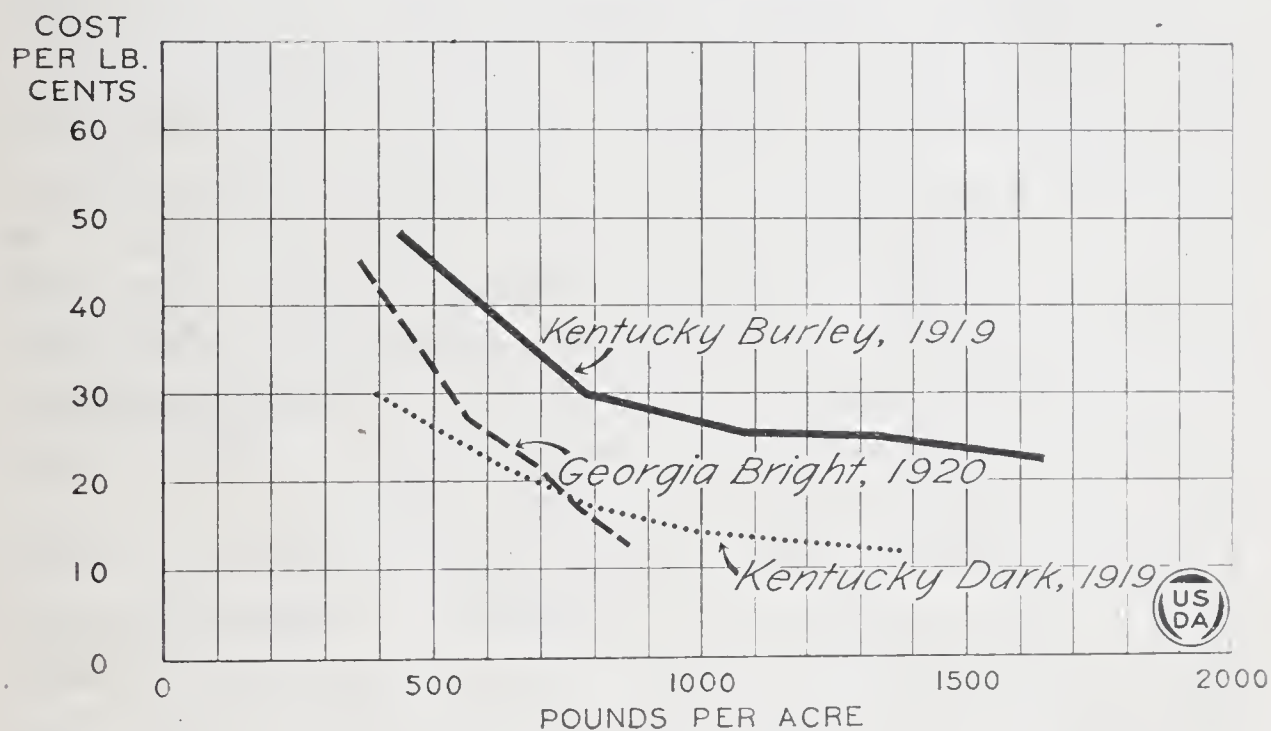


FIG. 20.—Influence of yield per acre on the cost of producing a pound of tobacco. While the cost per acre usually increases with the yield the cost per pound tends to decrease. High yields involving a rank, coarse growth, however, are often associated with poor quality and low returns per pound.

growing sections most of the tobacco farms are operated by owners, while in other sections probably as much as half of the total production is under some form of tenancy. In some sections considerable tobacco is grown on a cash rental basis in which the owner furnishes only the land. Under the share rental system, which is rather common in several districts, the tenant may operate the entire farm or he may be simply a "cropper," growing only tobacco. In both cases

the tenant usually receives half the value of the crop. The principal item furnished by the tenant is hand labor, the division of most other items between landlord and tenant varying considerably. Under ordinary circumstances probably a majority of tobacco growers owning their farms require no financial aid in producing the crop. When such aid is needed it is usually extended by local banks on personal notes without indorsement. Mortgages on live stock or crop liens are not commonly given as security for cash advances during the crop year. The tenant in some cases is financed entirely by the farm owner, who is reimbursed when the crop is sold. In many cases, however, the tenant borrows from local banks on his personal note, which is to be retired when the tobacco is sold and which usually must bear indorsement. In some sections merchants and dealers extend credit to growers for fertilizers and implements.

In the Burley district of Kentucky the majority of the farms are operated by the owners, but the tobacco crop is produced largely by croppers, who usually receive half the proceeds, except where the owner furnishes teams and machinery, in which case the cropper's share is one-third the proceeds. Similar conditions exist in western Kentucky and Tennessee, except that a somewhat larger proportion of the crop is produced by farm owners. Financing tobacco production in these States is accomplished in much the same way as in northern tobacco-growing districts.

In the South Atlantic States, more particularly in the Coastal Plains region, the percentage of tenancy is very high on tobacco farms, with a large proportion of owners nonresident on the farm. The tenant's share of the crop is one-half or two-thirds, depending on whether the landlord furnishes all or only one-third the fertilizer used, the tenant in both cases furnishing labor, teams, and machinery. The tenant is financed chiefly by the landlord or the local supply merchant, who is also a fertilizer dealer. Crop liens and chattel mortgages are commonly taken as security. In the Piedmont section the farms are smaller, and a larger proportion of owners operate their farms. Under the rental agreement chiefly employed, the tenant furnishes teams, machinery and labor and three-fourths of the fertilizer and receives three-fourths of the crop. The tobacco crop is

grown more largely on a cash basis. Larger landowners borrow from local banks and furnish their tenants, so that crop liens are not extensively employed.

Tobacco Marketing.

The marketing of tobacco varies considerably in different tobacco-producing sections of the country. In general there are three methods—the auction system, farm selling, and co-operative marketing.

The auction system is practiced principally in Maryland, Virginia, North Carolina, South Carolina, Georgia, Tennessee, Kentucky, West Virginia, southern Ohio, Indiana, and Missouri. Most tobacco produced in the cigar-leaf sections of Wisconsin, Ohio, Pennsylvania, Florida, Georgia, and the Connecticut Valley is marketed on the farm. Co-operative marketing is practiced more or less in every tobacco-producing section of the country. There is only a small amount of tobacco that is not marketed by one of these methods.

Preparation of Tobacco for Sale Under Auction System.

In preparing tobacco to be sold at auction, as soon as the tobacco is cured it is brought into a soft, pliable condition and assorted according to quality, color, length, and other factors. Where the tobacco is cured on the stalk the leaves must first be stripped from the stalks for assorting. The number of lots made by each producer varies considerably, depending upon the accuracy with which the tobacco is assorted and also upon the size and character of the crop. From 5 to 12 lots are usually made from each curing or barn of tobacco. Except for a general knowledge of the qualities of tobacco farmers have no guide in this assorting process. In most cases they separate their tobacco into lots of similar character without knowing to what grades the tobacco belongs or for what use the tobacco is suited. This being true, the farmer is at a loss to know the market value of his tobacco even after carefully assorting it. The principal reason for this condition is due to the fact that there are no generally recognized standard grades for tobacco.

After the tobacco is assorted into various lots by the farmer it is tied into hands, or bundles, as they are some-

times called, each hand containing 5 to 25 leaves. The hands are then hung on laths or sticks so that they can be handled easily without breaking or tangling the tobacco. The tobacco is then conditioned for market. Tobacco is usually conditioned on the farm in one of three ways, (1) by hanging it loosely in an open shed during a warm moist day, (2) by hanging it in a damp cellar or steam room, (3) by sprinkling it lightly with water and packing it into a bulk. In conditioning for market the general tendency is to put too much moisture in the tobacco, especially when it is sprinkled, and sometimes it is delivered wet and badly bruised. To be in the best marketable condition the tobacco should contain from 15 to 20 per cent of moisture.

The Auction Methods of Selling.

Tobacco is sold at auction in three ways—by publicly selling loose or unpacked tobacco to the highest bidder, by publicly selling in packed form to the highest bidder, and by closed-bids auction of packed tobacco.

The loose-leaf auction system.—The first method, often referred to as the loose-leaf auction system, is the method by which the majority of tobacco produced in the United States in the past two decades has been sold. Practically all of the auction markets of the country operate on the loose-leaf auction plan, with the exception of Baltimore, Md., which is a packed-tobacco market operating under the closed-bid auction plan, and Louisville, Ky., which is a packed-tobacco market operating on the public-auction plan. The market at Cincinnati, Ohio, is operated principally on the loose-leaf auction plan, but it has also a public auction market for packed tobacco.

As a rule the tobacco is taken to the loose-leaf auction market on the laths, where each lot is stripped from the laths and placed into a large flat-bottomed basket. The baskets containing the tobacco are then weighed and arranged according to quality in rows on the floor of a loose-leaf auction sales warehouse. In some markets, instead of using baskets, the lots are merely weighed and placed in piles on the floor of the warehouse. On each basket or pile is placed a ticket showing the name of the farmer who owns the tobacco, the number of pounds contained in the lot, and

the consecutive number given to the lot. The tobacco is then sold in piles or lots ranging from 10 to 1,500 pounds to the highest bidder at public auction. As the sale proceeds from basket to basket a clerk of the warehouse enters on each ticket the price per pound at which the tobacco is sold, the name of the buyer, and the grade assigned to the lot by the buyer. As a rule, the buyers for the large companies are governed in their bids entirely by their private grades, so it becomes largely a matter on the auction floors



LOOSE LEAF FLOOR OF AUCTION SALES WAREHOUSE.

FIG. 21.—The different lots of tobacco as brought in by the farmer are weighed, properly tagged, and arranged in piles on the warehouse floor according to grade, usually after having first been placed in flat-bottom baskets. At the appointed hour the piles are auctioned off in rapid succession. The warehouseman, after deducting certain fees, pays to the farmer the net proceeds and collects this amount from the buyer.

for the buyer first to determine to which of his grades, if any, a certain lot of tobacco belongs. Having determined the grade, he knows the limit that his company allows him to bid on the lot. Each buyer or manufacturer has for his own use a private system of grades. After the tobacco once leaves the farmer's hands it is handled almost entirely by grade.

In some of the larger markets the sales proceed very rapidly. In many markets the local board of trade requires the auctioneer to sell as high as 240 lots of tobacco in an hour's time. After the sale is over the farmer has a right to refuse the price offered, in which case he can either have the tobacco put up at auction the second time or have it removed from the warehouse for sale elsewhere. If the price offered is accepted, the auction-sales warehouseman renders the farmer an account, showing the number of pounds and the price of each lot sold, and gives him a check for the total amount of the sale, less the warehouse charges, which usually include an auction fee, a weighing charge, and a commission for selling.

Each buyer removes the tobacco purchased by him from the auction-sales warehouse to a redrying plant or packing house, where the tobacco is placed in a safekeeping condition and packed into hogsheads, ready for storage or shipment. A large percentage of the tobacco is bought direct by the manufacturer, in which case the tobacco, after being conditioned and packed, is usually shipped to the private-storage warehouse of the manufacturer, where it remains in storage until it is ready to be manufactured. The large amount of tobacco bought for export trade is shipped abroad for storage. Most of the independent buyers have their tobacco stored in public storage warehouses, where the tobacco is held for resale. In such cases tobacco is usually resold on samples which are taken from the hogsheads of tobacco while in storage.

Selling in packed form at public auction.—Tobacco to be sold at public auction in packed form is prepared by the farmers in the same way as tobacco to be sold under the loose-leaf auction system, except that it is packed into hogsheads or tierces containing from 500 to 2,000 pounds and then shipped to sales warehouses. When tobacco is offered for selling, the packages are arranged in rows on the floor of the warehouse in very much the same manner that the baskets are arranged on the floor of a loose-leaf auction warehouse. The packages are then opened up in a manner that will not disturb the form of packing. The tobacco is then sold at public auction as the buyers pass from lot to lot examining and bidding on the tobacco. When the sale is

over the lots are placed back into the same containers and returned to storage, where the tobacco is held for resale or manufacture by the new owner.

The closed-bid auction method.—Under the closed-bid auction plan the packages are prepared in the same form as when the tobacco is sold in packed form, but the containers are opened up and sampled when they are received at the warehouse. Samples are made up of from four to nine hands drawn from different parts of the package and are labeled to preserve the identity of the sample and sealed to prevent substitution. At some warehouses these samples are drawn and sealed by persons who are licensed under the United States warehouse act for the purpose. The samples are then displayed by the broker or commission merchant to whom the tobacco was consigned for sale. Each buyer enters on a slip of paper, opposite the number of each sample, the price per pound which he is willing to give for the lot represented by the sample and drops it into a box. At the end of the day the box is opened and the tobacco is sold to the buyer who offers the highest price.

The distribution of principal markets for the first-hand sale of leaf tobacco is shown in Figure 22.

Farm Selling of Tobacco.

Possibly next to the auction-sales method of selling tobacco the most general practice is to sell the tobacco on the farm to buyers who visit producing districts. In most sections in which tobacco is thus sold the farmer makes little

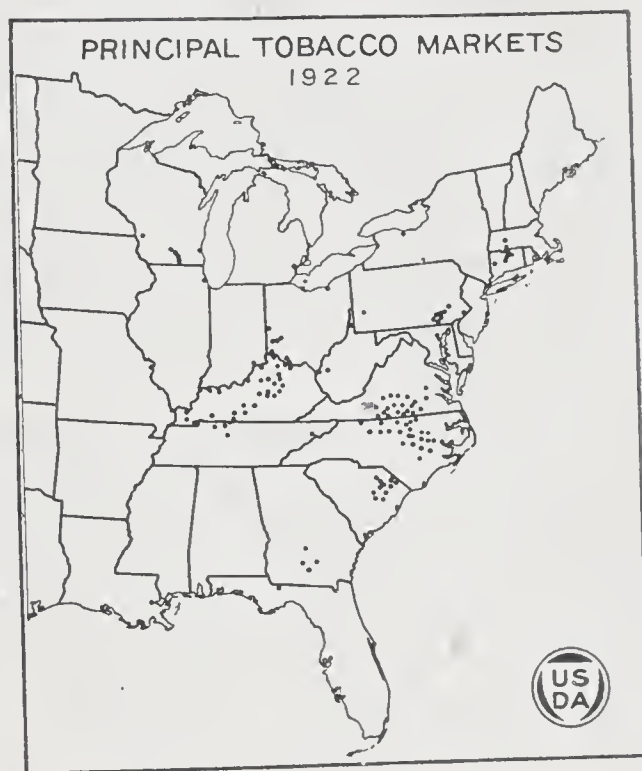


FIG. 22.—Market centers for first-hand sales of leaf tobacco are located mainly within the principal producing districts. Where the loose-leaf auction system of selling prevails there are usually numerous smaller markets, in addition to the larger market centers.

attempt to assort his tobacco with respect to quality. As soon as the tobacco is cured, the farmer watches an opportunity when he can find the tobacco in a natural condition, soft enough to be handled without breaking. He then takes the tobacco down from the barns or sheds, strips the leaves from the stalks, and ties them roughly into large hands, which are packed into bundles of approximately 100 pounds each. Usually before the tobacco is taken down from the barns or after it has been placed into bundles it is examined by country buyers and bought, but very often it is bought at a general average price without being examined. The tobacco is then delivered to a place designated by the buyer, where the bundles are opened up, the hands untied, and the tobacco assorted according to the buyer's grades. The tobacco is then retied into hands and conditioned for storage. After conditioning the tobacco is ordinarily packed into cases averaging about 300 pounds and placed in storage warehouses.

After the tobacco has passed through the spring sweat the cases are opened up and sampled, at which time it is offered for sale to the manufacturer. The tobacco is usually sold by the dealers according to the quality of each lot, whereas the farmer sells the tobacco unassorted for a general average price. In some instances the tobacco is bought by representatives of the manufacturer direct from the farmer, in which case the manufacturer has the tobacco assorted and packed for storage in the same manner as is ordinarily practiced by the independent country buyer. The contract method of buying is practiced to a large extent in many of the cigar-leaf producing sections. Very often the country buyers purchase a large percentage of the year's crop before it is harvested, the farmer agreeing to deliver the tobacco after it is produced, cured, and packed into bundles.

In all sections in which farm selling is practiced the farmers have practically no conception of tobacco grades, and very few realize the wide variation in the prices of tobacco of different qualities. Their main source of information as to the value of tobacco is the price received by neighbors, which is usually a flat price of so many cents per pound for all qualities of tobacco. The farmer who

sells his tobacco at an average of 30 cents has very little idea what proportion of it has a market value of from 3 to 5 cents per pound and what from 80 to 90 cents per pound. This is due to the fact that there are no standard grades by which the farmer can be governed. With tobacco varying in price from 1 cent to \$2 per pound, it is not practical for a farmer to estimate with any degree of accuracy the market value of his tobacco without the use of some uniform system of grades. Neither is it possible for market quotations to be of much value without standard grades.

Cooperative Marketing.

Cooperative marketing has followed principally three general lines: Cooperative packing, cooperative sales agencies, and cooperative pooling.

Cooperative packing.—In many sections farmers have found that it was impracticable for them to pack their individual crops for storage, due to the fact that they were unable to employ expert sorters and also on account of the small size of the lots of tobacco of a particular quality that would be produced on a single farm. To own and operate cooperative packing houses where the tobacco could be assorted into lots of like qualities by trained men has proved of advantage. In this way the farmers were able to pack complete cases or hogsheads of tobacco of similar quality, whereas in individual packing it would be necessary in most instances to mix the different qualities in order to fill cases of commercial size. The packing houses as a rule have not been altogether successful, due, perhaps, to the fact that they were not able to operate continually from year to year. In years in which there was little demand for tobacco the packing houses had more tobacco than they could conveniently care for, while in other years when the demand and prices were good the farmers would sell their tobacco direct to the dealers and manufacturers without packing, leaving the packing houses idle. Ordinarily no special provisions were made for the sale of the tobacco which was jointly packed in this manner. Each farmer or group of farmers interested in a particular packing was required to be his own sales agent.

Cooperative sales agencies.—In some sections farmers organize cooperative sales agencies in connection with their packing houses. These agencies sell the tobacco that is cooperatively packed by the farmers. In practically all cases the individual farmer reserves the right to accept or reject the price offered to these agencies, and in most cases the individual farmer is allowed to sell his packing independent of agencies. However, this is limited to some extent in some agencies by requiring the individual producer when selling his tobacco independent of the agency to pay a fee to the agency. In other sections the agencies were formed independent of the cooperative-packing plants. In these sections the individual farmer usually does his own assorting and packing and ships his tobacco to a storage warehouse under consignment to the cooperative-selling agency. The cooperative agency in this particular instance performs the function of a commission merchant.

Cooperative pooling.—The most common form of cooperative marketing that is practiced is cooperative pooling. Pools have been formed in practically every section of the country in which tobacco is produced. Until recent years the pooling idea has been worked out on a small scale in most sections, but during the last two years several very large pools have been formed. These large cooperative pools have absorbed a number of the smaller pools, and one of the principles on which they are formed is to control a large percentage of the production in certain areas. In organizing a pool of this kind, from 50 to 75 per cent of the tobacco produced in a particular section is determined upon as a goal, and the organization is not put into operation until this percentage of the tobacco has been pledged to the pool by individual farmers who sign contracts. In these contracts the farmers agree to sell and deliver their entire crops of tobacco for a certain number of years to the pool, or cooperative association, which will sell the tobacco and make returns to the farmers after deducting all operating expenses. These cooperative associations are organized without capital stock.

To secure the necessary funds to pay for the operating expenses of the association and to make advances to its members the association borrows money on its notes, which are

usually secured by warehouse receipts showing the type, form, grade, weight, and condition of the tobacco, and the obligations assumed by the warehouseman. The grade or other class of the tobacco shown on the warehouse receipts, if issued under the United States warehouse act, are usually taken from an official inspection, grade, and weight certificate issued at the conditioning plant. This is done in order to save opening up the tobacco after being received into storage, which is not only expensive but causes considerable damage to the tobacco.

The associations found that in many cases the number of public storage houses available was not sufficient to take care of their storage requirements, and it became necessary to organize subsidiary warehousing corporations to perform this function. These corporations are organized as a rule with sufficient capital stock to purchase, own, and operate storage warehouses. In some cases these subsidiary corporations own and operate redrying and conditioning plants in connection with the operation of storage warehouses, and in other cases they own and operate assorting and packing houses in which the tobacco is prepared for storage.

Under the pooling plan the tobacco is assorted and tied into hands by the individual farmer and delivered to the receiving warehouses of the association at such times and places as it directs. As the tobacco is received into the warehouses of the association it is weighed, placed into baskets, and tagged in the same manner as in the case of the auction system, but instead of selling it at auction the baskets are graded by expert graders who are employed by the association. Each farmer is given a statement showing the grades of the tobacco delivered to the association with the weight of each grade. At the same time an advance payment is made on the tobacco delivered. The amount of this advance is governed by the association and proportioned according to the particular quantity of each grade delivered to the association.

The association has full jurisdiction over the tobacco after it has been received and may condition, warehouse, or sell it at will. A certain percentage of the tobacco as a rule is sold direct to dealers and manufacturers from the loose-leaf receiving floors of the association. The remainder of the

tobacco is shipped by the association to conditioning plants, where it is conditioned and packed into hogsheads or cases for storage. As the tobacco is packed it is inspected, regraded, sampled, and weighed by competent and reliable persons, many of whom are licensed for the purpose under the United States warehouse act. It is then delivered to public storage houses, many of which are also licensed under the same law.

Prices of Tobacco.

Under the systems used in marketing tobacco, what may be called a wholesale market for unmanufactured tobacco

PRICES OF LEADING TYPES OF TOBACCO, 1909-1921.

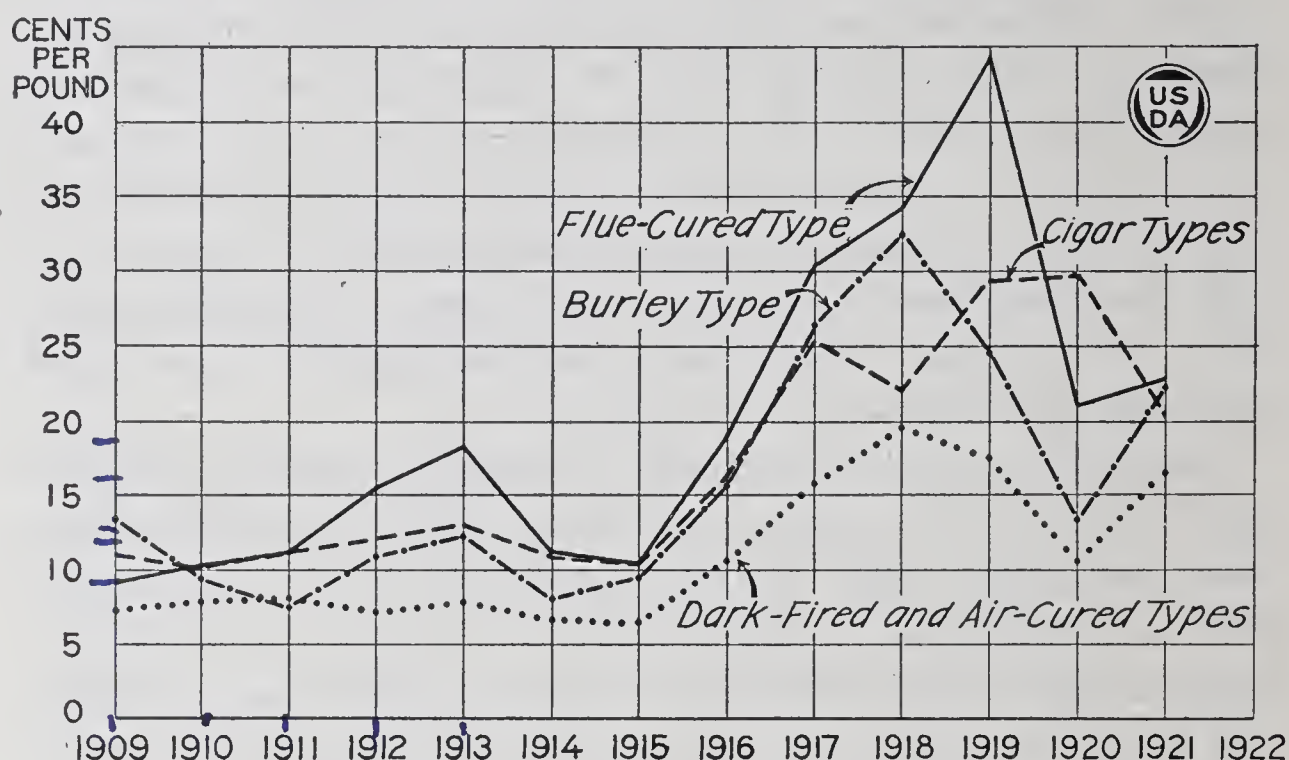


FIG. 23.—In recent years the bright flue-cured type has maintained the highest price level because of increased demand for this type in the domestic manufacture of cigarettes and in export trade. The lowest price level is shown by the dark fire-cured and air-cured types, the greater portion of which is exported.

has not been developed as has been for other commodities. As a rule, when tobacco is sold in large quantities sale is effected through private methods, and limited data are available as to prices received. The only prices are the general prices received by farmers. These are based as a rule upon the average price received for all qualities of tobacco. It has not been practicable to compile prices by grades, owing to the absence of any uniform system of grading. In securing data as to the average prices by types it has been necessary to follow the line of geographical division rather than of type characteristics.

In the graph showing tobacco prices by principal types (Fig. 23) it has been necessary to group all tobacco into four divisions: First, the cigar types cover wrapper, binder, and filler tobacco of Wisconsin, Ohio, Georgia, Florida, Pennsylvania, New York, and the Connecticut Valley, on which the farm prices range from 3 cents to \$4 per pound; second, the Burley type covers all grades of Burley tobacco grown in Indiana, Ohio, West Virginia, Kentucky, and Tennessee, on which the price ranges from 1½ cents to \$1 per pound;

AVERAGE PRICE OF TOBACCO, UNITED STATES, 1863-1921.

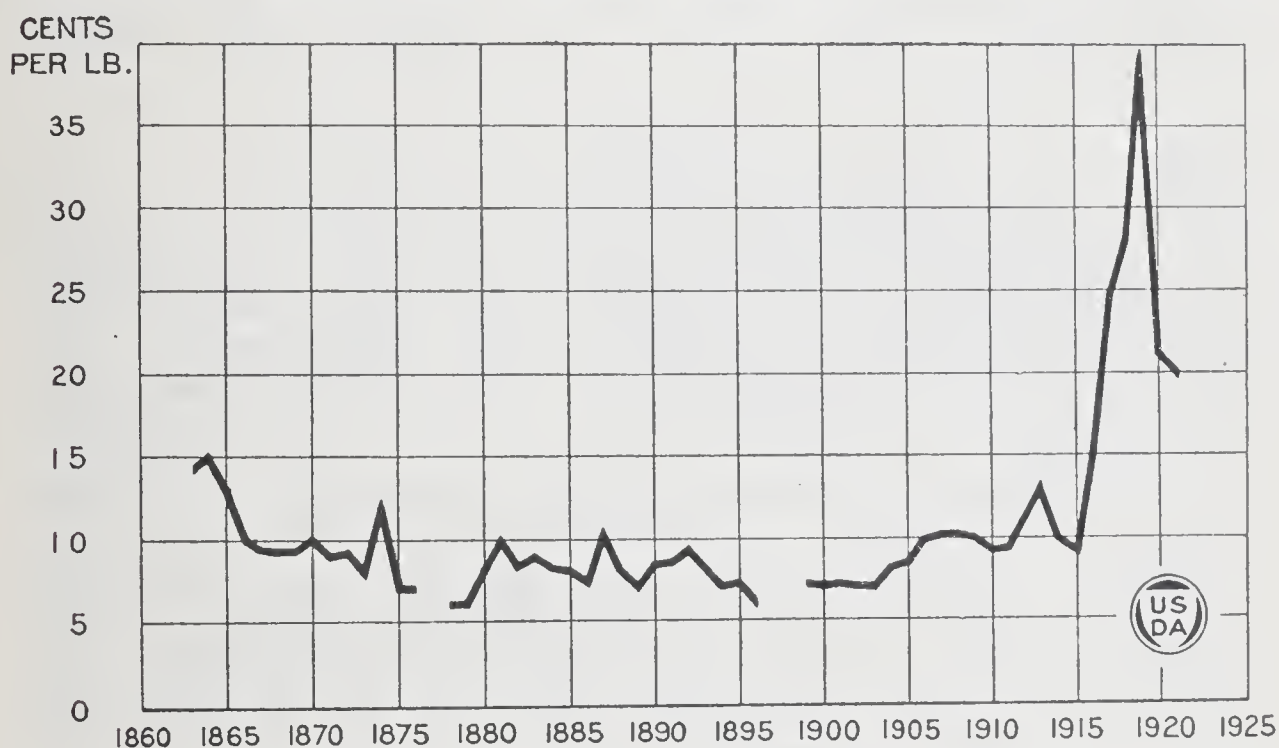


FIG. 24.—From 1865 to 1879 there was a fairly steady decline in average farm price, followed by a somewhat higher price level, for the most part, up to the outbreak of the World War. The abnormally high price level of 1919 was due mainly to the extraordinarily high price of the bright flue-cured type for that year.

third, the flue-cured type covers the "old belt" of Virginia and North Carolina and the "new belt" of North Carolina, South Carolina, and Georgia, on which the price of the various qualities range from 1½ cents to \$1.25 per pound; and, fourth, the dark-fired and air-cured types cover all grades of Maryland and eastern Ohio export, Virginia dark-fired and sun-cured, dark-fired types of Kentucky and Tennessee, and the one-sucker and air-cured types of Indiana, Kentucky, and Tennessee, on which the prices range from 1 to 65 cents per pound.

The following table shows the average farm prices for all types and grades, as far as records are obtainable, from 1618 to 1853:

The accompanying graph (Fig. 24) shows the prices from 1863 to 1921. The World War caused the abnormally high average farm price of 39 cents per pound in the year 1919, which had not been previously equaled with the exception of the English Government prices of 1618, 1619, and 1620. The general price for half a century, from 1866 to 1915, was 8.5 cents per pound. During the five years from 1917 to 1921 the general average price was 26.4 cents per pound.

Average farm price of tobacco in the United States (cents per pound).

Year.	Price.	Year.	Price.	Year.	Price.	Year.	Price.
1618.....	54.75	1684.....	4.12	1730.....	1.52	1765.....	2.03
1619.....	54.75	1688.....	3.08	1735.....	4.2	1771.....	4.56
1620.....	54.75	1695.....	3.09	1743.....	3.04	1780.....	3.04
1639.....	6.08	1697.....	3.09	1744.....	4.06	1790.....	3.4
1640.....	6.08	1698.....	3.62	1762.....	4.56	1847.....	5.0
1647.....	6.08	1699.....	3.13	1763.....	4.56	1849.....	7.0
1664.....	3.09	1703.....	2.03	1764.....	4.06	1853.....	10.0

Financing the Marketing of Tobacco.

Tobacco is not suitable for manufacture until it has aged properly, which ordinarily means that it must be in storage from two to three years. In recent years the tendency has been to shorten the aging period by artificial sweating or by using a larger percentage of new tobacco in the blends, which are ordinarily made up of tobacco 1, 2, and 3 years old. In the manufacture of most tobacco products the tobacco used is, on an average, 18 months old. This makes it necessary for the trade to carry large stocks of tobacco on hand. The burden of carrying these stocks has been, for the most part, placed upon the dealers and manufacturers, as the farmer usually disposes of his tobacco as soon as possible after it has been produced. In the cigar-leaf producing States and in Maryland some farmers have held their tobacco on the farms or in public storage warehouses for considerable periods awaiting more favorable markets.

When tobacco is placed in a warehouse a warehouse receipt is issued therefor. This receipt is frequently used by the depositor as collateral for a loan. Comparatively few

farmers have used warehouse receipts because of the quite general practice on the part of farmers of selling their product as soon as possible after it is harvested. The manufacturer and dealer, on the other hand, are quite familiar with the use of these receipts.

With the development in the past two years in cooperative tobacco marketing organizations, the use of the warehouse receipt on the part of those who control the tobacco before it passes into the hands of dealers and manufacturers has



FEDERAL BONDED WAREHOUSE FOR STORING TOBACCO.

FIG. 25.—When tobacco is placed in a warehouse, licensed and bonded under the United States warehouse act, a negotiable warehouse receipt of prescribed form is issued therefor. This receipt is generally acceptable as collateral for loan purposes.

become quite general. These associations, almost without exception, have placed their tobacco in warehouses licensed under the United States warehouse act. They have found receipts issued under this act to constitute a high type of collateral, which is acceptable to the War Finance Corporation and generally acceptable to the leading banks as collateral for loan purposes. The value of these receipts is apparent from a study of the following copy of the form in use :

PAID IN CAPITAL STOCK
\$20,270.00

AMOUNT OF BOND
\$50,000.00

THE DOE WAREHOUSE COMPANY

INCORPORATED UNDER THE LAWS OF NORTH CAROLINA

LICENSED AND BONDED UNDER THE U. S. WAREHOUSE ACT
LICENSE NO. 5-62, EXPIRES MAY 3, 1923

WAREHOUSE RECEIPT
AND PACKAGE
NO.

ORIGINAL
NEGOTIABLE

WAREHOUSE RECEIPT
AND PACKAGE
NO.

RECEIVED from.....of....., the tobacco described below, stored in THE DOE WAREHOUSE, Bonded Compartment No....., at Oxford, N. C., for which this receipt is issued, subject to the United States warehouse act, the regulations for tobacco warehouses thereunder, and the terms of this contract.

PRIVATE HOGSHEAD NUMBER AND MARKS.	GROSS WT.	TARE WT.	NET WT.	FORM UNSTEMMED	TYPE		CONDITION OF THE TOBACCO
					1 GRADE	UNIFORMITY OF GRADE	
							<div><div>Re-dried</div><div>Air-dried</div><div>Green</div></div>

¹ According to the standards of the tobacco trade in this locality.

The warehouseman claims a lien on said tobacco for charges, advances made, and other liabilities incurred as follows:

Storage from date (including receiving and delivering) \$1.50 for first four (4) months or fraction thereof; for each additional month or fraction thereof at rate of 25 cents.....	\$.....
Inspecting and Sampling \$1.50 per Hgs.....	\$.....
Grading.....	\$.....
Weighing.....	\$.....
Freight and Drayage.....	\$.....
.....	\$.....
.....	\$.....
.....	\$.....

² Strike out words not applicable.

Said tobacco is NOT INSURED by the undersigned warehouseman against loss or damage by fire or lightning unless expressly stated otherwise on the face of this receipt.
Said tobacco is accepted for storage under this receipt, subject to said act and regulations, for a period not exceeding three years from the date hereof.
Said warehouseman is not owner of the tobacco, either solely or jointly, or in common with others, unless shown by "yes" here.....

Upon the return of this receipt properly indorsed and the payment of all liabilities due the undersigned warehouseman therefor, as described herein, said tobacco will be delivered to the above named depositor or his order.

Issued at Oxford, N. C., on....., 192..

THE DOE WAREHOUSE COMPANY
Per.....

Back of W. A. Form T-6.

STATEMENT OF OWNERSHIP AND ENCUMBRANCES.

Each of the undersigned hereby certifies on the date stated that he is the owner of the tobacco covered by this receipt and that, other than the warehouseman's lien evidenced on the face of this receipt and the following, there are no liens, mortgages, or other encumbrances on said tobacco:

_____, 192____.
(Signed) _____

_____, 192____.
(Signed) _____

INDORSEMENTS.

Upon demand, deliver the tobacco covered by this receipt to _____ or his order.
_____, 192____.
(Signed) _____

Upon demand, deliver the tobacco covered by this receipt to _____ or his order.
_____, 192____.
(Signed) _____

Received delivery of the tobacco covered by this receipt.
_____, 192____.
(Signed) _____

In Figure 26 are shown the locations of United States licensed warehouses and the points at which are functioning inspectors, graders, and weighers licensed under this act in connection with these licensed warehouses.

Exports and Imports.

Tobacco was the first article of export of the colonies, and 20,000 pounds were sent to England from Jamestown in 1618. Exports had reached 100,000,000 pounds just prior

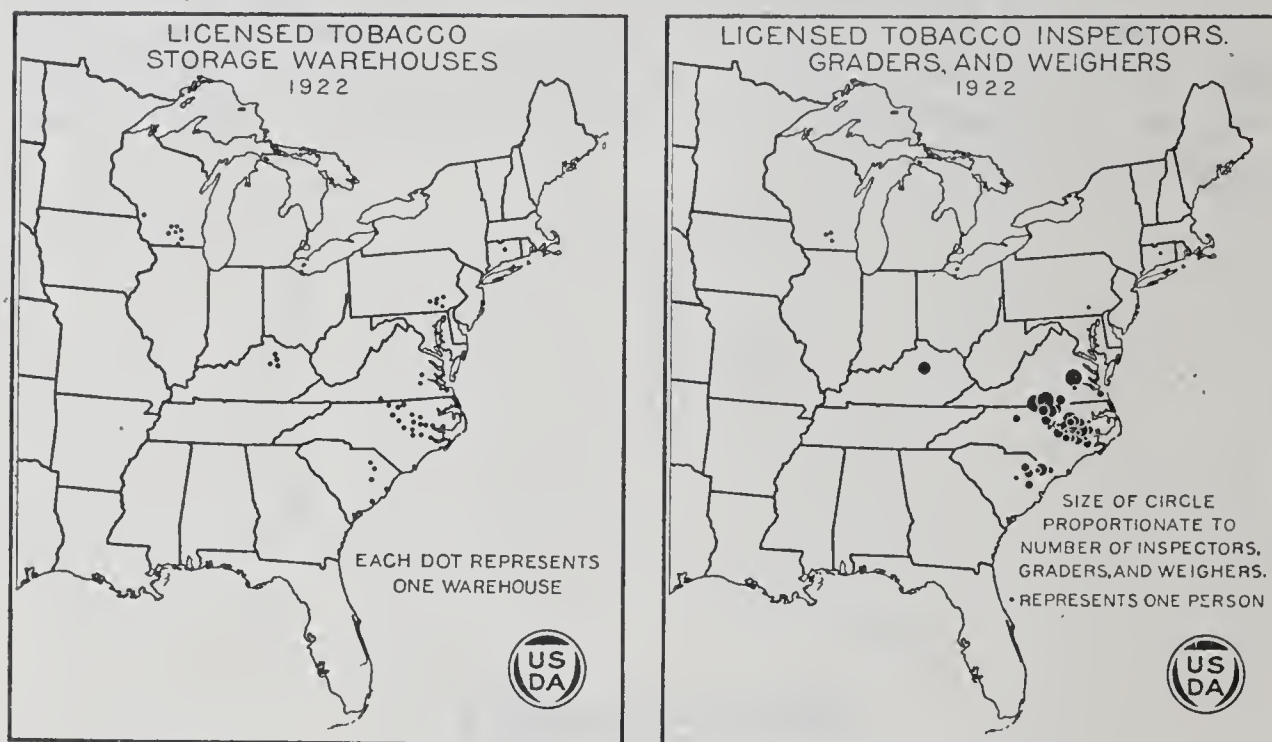


FIG. 26.—Licensed storage warehouses, and inspectors, graders, and weighers are now (1922) to be found in most of the principal tobacco-growing sections, thus affording approved facilities for placing tobacco in storage when growers do not wish to immediately sell their crop.

to the Revolutionary War, and by 1870 the average was in excess of 200,000,000 pounds. In the last three decades there has been a fairly uniform increase in average exports of leaf tobacco from 250,000,000 pounds in 1891 to 460,000,000 pounds for the 10-year period ending with 1921. At the close of the World War exports temporarily were in excess of 750,000,000 pounds. Exports of manufactured tobacco, though considerable, normally aggregate less than one-tenth of the leaf exports, the principal items being cigarettes, plug, and smoking tobacco. During and immediately following the World War, however, exports of cigarettes were greatly increased, the maximum of about 48,000,000 pounds having been reached in 1919. The United Kingdom is much the

largest purchaser of American tobacco, taking more than a third of the total exports, while France, Italy, and Germany each take about 10 per cent, the Netherlands about 6 per cent, Spain 5 per cent, Australia and Canada each 4 per cent, Belgium 3 per cent, and China 2 to 5 per cent. Exports to China have increased decidedly in recent years.

The increase in exports of leaf tobacco have not kept pace with increased production. Originally the bulk of the crop was exported, and in 1790 over 75 per cent of the total went abroad, while by the middle of the last century the fraction exported was two-thirds. At the close of the century exports averaged only about 38 per cent of the production, but since that time there has been no further permanent decline in the portion of the crop exported. Statistics of exports by types are not available, and only estimates can be made. It is well known that the dark fire-cured and air-cured types and the bright flue-cured furnish the bulk of leaf exports. The quantity of cigar leaf sent abroad is relatively unimportant, and perhaps not more than 10 to 15 per cent of the Burley crop is exported. It is estimated that about 75 per cent of the combined dark fire-cured and air-cured types goes to foreign countries. Since the production of these types is not increasing much, it is apparent that the increased exports of leaf are being derived largely from the bright flue-cured cigarette type. This indicates a foreign as well as a domestic increase in demand for the cigarette. Available information indicates that somewhat more than half the production of flue-cured leaf is exported.

Imports of leaf tobacco averaged 5,000,000 pounds at the outbreak of the Civil War and at the outbreak of the World War averaged about 60,000,000 pounds, or somewhat more than 14 per cent of the exports. Three principal types are imported, namely, cigar-wrapper leaf from Sumatra and Java, cigar filler and wrapper from Cuba, and cigarette tobaccos from Turkey and Greece. Considerable quantities of leaf have been imported from Cuba for a century, and Cuban tobacco largely formed the basis of development of the great cigar-manufacturing industry. For the period 1891-1895 imports from Cuba averaged 20,000,000

graphically the distribution of leaf in the manufacture of cigars, cigarettes, and tobacco and snuff. The figures include most of the imported leaf, which constitutes 5 to 10 per cent of the total leaf consumed in manufacture. So far as concerns comparison with production on the basis of farm weight, however, these imports are fully offset by the shrinkage in weight which tobacco undergoes during the aging process, which amounts on the average to about 10 per cent. With an average total consumption of leaf amounting to about 370,000,000 pounds for the five-year period 1897-1901, 26 per cent of this total was used for the manufacture of cigars, 4 per cent for cigarettes, and 70 per cent for tobacco and snuff. For the period 1907-1911 the total leaf consumed averaged 507,000,000 pounds, with cigars accounting for 28 per cent, cigarettes 5.2 per cent, and snuff and tobacco 66.8 per cent. For the five years ending in 1921 the total leaf consumed averaged 672,000,000 pounds, of which 25 per cent was used for cigars, 26.3 per cent for cigarettes, and 48.7 per cent for tobacco and snuff. The remarkable increase in quantity of leaf used for manufacture of cigarettes, as well as the accelerating rate of this increase, which began after a period of decline from 1897 to 1902, are seen in Figure 27.

TREND IN CONSUMPTION OF LEAF TOBACCO: CIGARS, CIGARETTES, TOBACCO, AND SNUFF, 1897-1921.

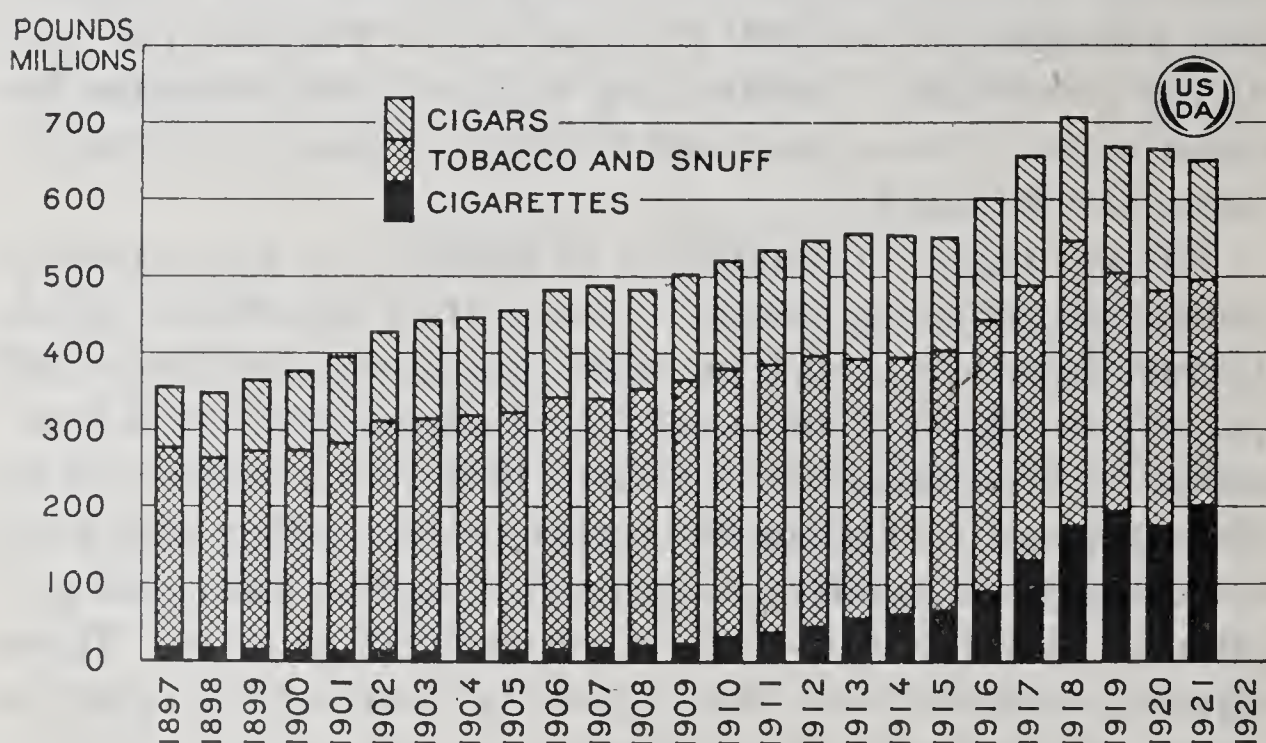


FIG. 27.—Since about 1908 there has been an exceedingly rapid increase in the quantity of tobacco used in cigarette manufacture. The manufacture of cigars shows only a moderate increase in recent years, while the quantity of leaf used for chewing and smoking tobacco and snuff shows almost no increase in the past 20 years.

This enormous expansion in the manufacture of the machine-made cigarette is the outstanding feature of the past quarter of a century in the tobacco industry.

The returns of the Commissioner of Internal Revenue include under the general head of "tobacco and snuff" the forms of manufacture known as plug, twist, fine cut, and smoking tobacco, in addition to snuff. It is significant that the production of plug, used principally for chewing, which has long been a principal form of manufacture, reached a maximum of nearly 186,000,000 pounds as early as 1897, and in recent years has shown a tendency to decline. The production of twist, which is used mainly for chewing, is not large, the maximum production of 17,000,000 pounds having been reached in 1918. Maximum production of fine cut, also chiefly used for chewing, amounting to 19,000,000 pounds, was reached in 1881 and has since steadily declined. Production of smoking tobaccos, extensively used for rolling of cigarettes by hand as well as for pipe smoking, has increased from 85,000,000 pounds in 1897 to a maximum of 258,000,000 pounds in 1918, although the increase since 1910 has been relatively small. Production of snuff has steadily increased from 14,000,000 pounds in 1897 to a maximum of 37,000,000 pounds in 1918. In 1890 the production of cigars first exceeded 4 billions in number, and in 1901 6 billions were produced. The 7-billion mark was reached in 1906, but since that date there has been little increase in production, except that in the single year 1920 the 8-billion mark was temporarily passed. It is worthy of note, however, that the average size or weight of the individual cigar has increased considerably in recent years. In the above figures the relatively unimportant item of so-called little cigars is not included. Production of cigarettes first exceeded 1 billion in number in 1885, and in 1895 more than 4 billions were manufactured, of which a half billion was exported. In 1905 the production was 5½ billions, of which two-thirds were retained for domestic consumption. In 1910 production had increased to 8½ billions, exclusive of manufactures in bonded warehouses for export. In 1917 the total production was in excess of 44 billions, including manufactures in bonded warehouses, of which 37 billions remained at home

for consumption. In 1921 production reached the enormous number of 60 billions, of which about $8\frac{1}{2}$ billions were exported. In brief, the use of tobacco for chewing has been giving way to smoking, the first evidence of which could be seen in increased consumption of cigars and smoking tobacco, while more recently these forms of smoking are giving place to the machine-made cigarette.

Utilization of Tobacco By-Products.

The stem or midrib of the leaf can not be utilized in some classes of manufactured tobacco, and in the aggregate a large surplus of stems thus accumulates, of which only a small proportion is exported. These stems, together with considerable quantities of inferior or damaged leaf and leaf scrap and, to some extent, the tobacco stalks, furnish the sources of various nicotine preparations. Nicotine is a valuable insecticide and is widely used for control of certain insect pests of plants. It is also extensively used in dips for control of mange or scab on sheep and cattle. Stems and other tobacco by-products, with or without previous extraction of the nicotine, are used in large quantities as fertilizer, their value for this purpose depending mainly on their content of nitrogen and potassium. No statistics are available as to quantities of tobacco by-product utilized in the preparation of insecticides or as fertilizer.

International Trade in Unmanufactured Tobacco.

A large portion of the world's crop of tobacco does not enter into commerce, being consumed by the producer in the unmanufactured state. On the other hand, to meet fully the requirements for various forms of manufacture, including the blending of mixtures according to the varying tastes of consumers, countries supplying large exports may also find it necessary to import certain foreign types of leaf, as is true of the United States. Some of the large consuming countries, moreover, produce little or no tobacco. Including those countries for which statistics are available, the average

yearly exports of tobacco in the world's trade for the period 1909 to 1913 amounted to 929,000,000 pounds. As shown in Figure 28, the United States is much the largest exporting country, furnishing 41 per cent of the total. The Dutch East Indies contributed nearly 18 per cent, Brazil about 6.5 per cent, Cuba 4 per cent, British India and the Philippine Islands each about 3 per cent. The tobacco exports of Turkey undoubtedly were important for this period, both in quantity and quality of product, and while full statistics are not available she probably ranked along with Brazil in quantity of leaf supplied.

**INTERNATIONAL TRADE IN UNMANUFACTURED TOBACCO,
YEARLY AVERAGE, 1909-1913.**

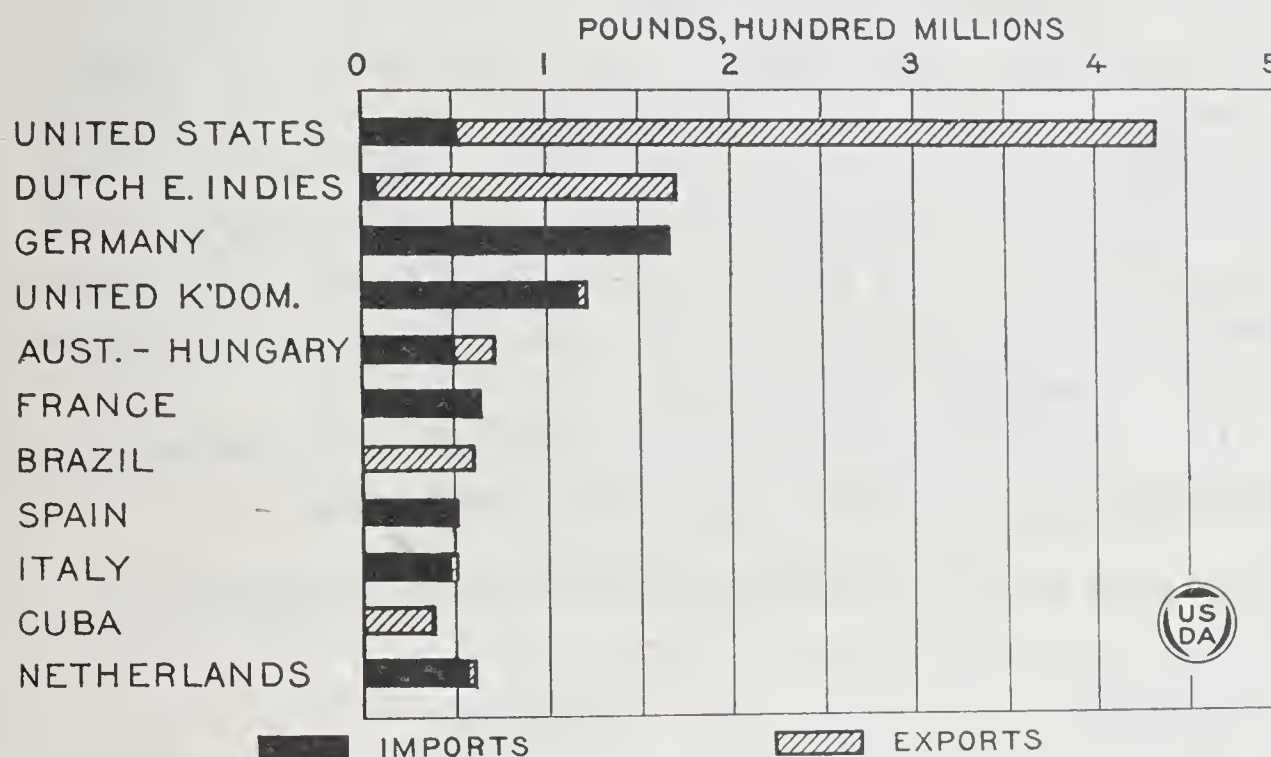


FIG. 28.—The United States is by far the leading country in exports but also imports considerable quantities of leaf tobacco. The Dutch East Indies rank second in volume of exports. Germany and the United Kingdom lead in imports.

Of the total imports in world trade for the same period, amounting to 844,000,000 pounds, Germany received 20 per cent, the United Kingdom 14 per cent, France 7.5 per cent, Netherlands 7 per cent, the United States, Spain, and Austria-Hungary each about 6 per cent, Italy 5.5 per cent, and Belgium 2.5 per cent.

Import Duties and Internal Revenue Taxes on Tobacco.

Import Levies.

Import duties have been levied on tobacco, both in manufactured and unmanufactured form, almost from the beginning of the Federal Government. In earlier years the rates were comparatively low, but they were greatly increased during the Civil War period. Since that time the chief increases in rates have been in leaf tobacco. Cigars as such were first included in the act of March 27, 1804, while "paper cigars" were first listed in the act of July 30, 1846, and cigarettes in the act of July 14, 1862. In the latter act a distinction is first made between stemmed and unstemmed leaf, and in the act of March 3, 1883, a distinction is drawn between wrapper and filler grades of cigar leaf. The annual revenue accruing to the Government from tobacco imports averaged for the period 1868-1872 somewhat less than \$4,000,000, for the period 1888-1892 over \$12,000,000, and for the period 1908-1912 approximately \$24,000,000. The aggregate revenue from this source for the 50-year period 1872-1921 was more than \$800,000,000.

The following digest embraces a list of tariff acts relating to tobacco, with rates of duty, from 1789 to date:

Rates of duty on tobacco imports under the Constitution.

Date of act (and when effective).	Rates of duty.
July 4, 1789 (Aug. 1, 1789).	Snuff, 10 cents per pound; manufactured tobacco, 6 cents per pound; unmanufactured tobacco, 5 per cent.
Aug. 10, 1790 (Jan. 1, 1791).	Snuff, 10 cents per pound; unmanufactured, 5 per cent; manufactured, 6 cents per pound.
May 2, 1792 (July 1, 1792).	Unmanufactured, 7½ per cent; other tobacco duties remain.
June 5, 1794 (Oct. 1, 1794).	Snuff, 22 cents per pound; unmanufactured remains 7½ per cent; manufactured, 10 cents per pound.
June 7, 1794 (July 1, 1794).	Snuff remains 22 cents per pound; unmanufactured, 10 per cent; manufactured remains 10 cents per pound.
May 13, 1800 (July 1, 1800).	Snuff remains 22 cents per pound; unmanufactured, 12½ per cent; manufactured remains 10 cents per pound.
Mar. 26, 1804 (July 1, 1804).	Snuff remains 22 cents per pound; unmanufactured, 15 per cent; manufactured remains 10 cents per pound.

Rates of duty on tobacco imports under the Constitution—Continued.

Date of act (and when effective).	Rates of duty.
Mar. 27, 1804 (July 1, 1804).	Cigars, \$2 per 1,000; other existing rates remain.
July 1, 1812 (July 1, 1812).	Existing rates doubled until one year after the war.
Apr. 27, 1816 (July 1, 1816).	Snuff, 12 cents per pound; cigars, \$2.50 per 1,000; other manufactured, 10 cents per pound; unmanufactured, 15 per cent.
Mar. 2, 1833 (Jan. 1, 1834).	Existing rates in excess of 20 per cent to be reduced to 20 per cent by yearly reductions to July 1, 1842.
Sept. 11, 1841 (Oct. 1, 1841).	Unmanufactured, 20 per cent; other rates remain.
Aug. 30, 1842 (Aug. 31, 1842).	Snuff, 12 cents per pound; cigars, 40 cents per pound; other manufactured, 10 cents per pound; unmanufactured, 20 per cent.
July 30, 1846 (Dec. 2, 1846).	Snuff, 40 per cent; cigars and paper cigars, 40 per cent; other manufactured, 40 per cent; unmanufactured, 30 per cent.
Mar. 3, 1857 (July 1, 1857).	Manufactured, 30 per cent; unmanufactured, 24 per cent.
Mar. 2, 1861 (Apr. 2, 1861).	Snuff, 10 cents per pound. Cigars: Value of \$5 or less per 1,000, 20 cents per pound; value over \$5 to \$10 per 1,000, 40 cents per pound; value over \$10 per 1,000, 60 cents per pound and 10 per cent; unmanufactured in leaf, 25 per cent; other manufactured and other unmanufactured 30 per cent.
July 14, 1862 (Aug. 2, 1862).	Snuff, 35 cents per pound. Cigars and cigarettes: Value of \$5 or less per 1,000, 35 cents per pound; value over \$5 to \$10 per 1,000, 60 cents per pound; value over \$10 to \$20 per 1,000, 80 cents per pound and 10 per cent; value over \$20 per 1,000, \$1 per pound and 10 per cent. Unmanufactured in leaf and unstemmed, 25 cents per pound; stemmed, 35 cents per pound; other manufactured, 35 cents per pound.
Apr. 29, 1864 (Apr. 29, 1864).	Existing rates increased 50 per cent for 60 days.
June 30, 1864 (July 1, 1864).	Snuff and snuff flour, 50 cents per pound. Cigars and cigarettes: Value of \$15 or less per 1,000, 75 cents per pound and 20 per cent; value over \$15 to \$30 per 1,000, \$1.25 per pound and 30 per cent; value over \$30 to \$45 per 1,000, \$2 per pound and 50 per cent; value over \$45 per 1,000, \$3 per pound and 60 per cent. Unmanufactured, in leaf and unstemmed, 35 cents per pound; stemmed, 50 cents per pound; other manufactured, 50 cents per pound.
Mar. 3, 1865 (Apr. 1, 1865).	Stems, 15 cents per pound.
July 28, 1866 (Aug. 11, 1866).	Cigars, cigarettes, and cheroots, \$3 per pound and 50 per cent.
Mar. 3, 1883 (July 1, 1883).	Snuff and snuff flour, 50 cents per pound; cigars, cigarettes, and cheroots, \$2.50 per pound and 25 per cent. Unmanufactured, in leaf and unstemmed 85 per cent suitable for cigar wrappers, and more than 100 leaves in pound, 75 cents per pound; stemmed, \$1 per pound. Other leaf, unstemmed, 35 cents per pound; stemmed, 40 cents per pound. Other unmanufactured, 30 per cent; stems, 15 cents per pound; other manufactured, 40 cents per pound.

Rates of duty on tobacco imports under the Constitution—Continued.

Date of act (and when effective).	Rates of duty.
Oct. 1, 1890 (Oct. 6, 1890).	Snuff and snuff flour, 50 cents per pound; cigars, cigarettes, and cheroots, \$4.50 per pound and 25 per cent. Unmanufactured, in leaf for cigar wrappers—unstemmed, \$2 per pound; stemmed, \$2.75 per pound. Other leaf—unstemmed, 35 cents per pound; stemmed, 50 cents per pound. Stems, free. Other manufactured, 40 cents per pound.
Aug. 27, 1894 (Aug. 1, 1894).	Snuff and snuff flour, 50 cents per pound; cigars, cigarettes, and cheroots, \$4 per pound and 25 per cent. Wrapper, unstemmed, \$1.50 per pound; stemmed, \$2.25 per pound. Filler, unstemmed, 35 cents per pound; stemmed, 50 cents per pound. Stems, free. Other unmanufactured and manufactured, 40 cents per pound.
July 24, 1897 (July 24, 1897).	Snuff and snuff flour, 55 cents per pound; cigars, cigarettes, and cheroots, \$4.50 per pound and 25 per cent. Wrapper, and filler when mixed or packed with more than 15 per cent of wrapper, and all leaf the product of two or more countries when mixed or packed together, unstemmed, \$1.85 per pound; stemmed, \$2.50 per pound. Other filler, unstemmed, 35 cents per pound; stemmed, 50 cents per pound. Stems, free. Other unmanufactured and manufactured, 55 cents per pound.
Apr. 12, 1900 (Apr. 12, 1900).	Shipments from Porto Rico to United States, 15 per cent of existing rates + internal-revenue tax.
July 25, 1901.....	Shipments from Porto Rico to United States, free. (Proclamation by President.)
Mar. 8, 1902 (Mar. 8, 1902).	Imports from Philippine Islands of articles grown and produced there, 75 per cent of existing rates + internal-revenue tax. (Ceased Aug. 6, 1909.)
Dec. 17, 1903 (Dec. 27, 1903).	Imports from Cuba of products of soil or industry of that country, 20 per cent below existing rates. Not subsequently repealed.
Aug. 5, 1909 (Aug. 6, 1909).	Rates of July 24, 1897: Scrap, 55 cents per pound. These are the rates of the minimum tariff. The maximum tariff is 25 per cent higher and is to be in force to Mar. 31, 1910, and thereafter unless President by proclamation declares no discrimination by particular countries. These rates apply to Philippine Islands; imports exceeding 300,000 pounds of wrapper and filler mixed or packed with more than 15 per cent of wrapper; exceeding 1,000,000 pounds of filler; and exceeding 150,000,000 cigars. Internal revenue to be paid.
Oct. 3, 1913 (Oct. 4, 1913).	Rates of July 24, 1897, except scrap, 35 cents per pound. All articles the growth or product of the Philippine Islands, free.
May 27, 1921 (May 28, 1921).	Wrapper, and filler when mixed or packed with more than 15 per cent of wrapper, and all tobacco the product of two or more countries when mixed or packed together, unstemmed, \$2.35 per pound; stemmed, \$3 per pound. Other filler (all other leaf), unstemmed, 35 cents per pound; stemmed, 50 cents per pound. Other existing rates not changed.

Rates of duty on tobacco imports under the Constitution—Continued.

Date of act (and when effective).	Rates of duty.
Sept. 21, 1922 (Sept. 22, 1922).	Snuff and snuff flour, 55 cents per pound; cigars, cigarettes, and cheroots, \$4.50 per pound and 25 per cent. Wrapper, and filler when mixed or packed with more than 35 per cent of wrapper, and leaf the product of two or more countries when mixed or packed together, unstemmed, \$2.10 per pound; stemmed, \$2.75 per pound. Other filler, unstemmed, 35 cents per pound; stemmed, 50 cents per pound. Scrap, 35 cents per pound; stems, free; other unmanufactured and manufactured, 55 cents per pound. From Philippine Islands, if grown or produced there, free + United States internal revenue tax. All rates subject to change by the President after investigation of cost of production, domestic and foreign.

Internal Revenue Taxes.

Internal-revenue taxation of tobacco as a more or less fixed policy began during the Civil War. As a whole the rates of taxation reached a maximum during the later years of that war, while relatively high rate levels also came into effect in 1875 and again following the World War. At the outset a sliding scale of rates, according to value of the product, was applied to cigars, while for smoking and chewing tobaccos there was also a sliding scale based on value of product; but, in addition, rate differences based on character of raw material used in manufacture were applied. After a long period of flat rates, which began in 1867, the principle of a sliding scale according to value was revived for large cigars in 1917. On the other hand, flat rates have been applied to smoking and chewing tobaccos since 1872, and since 1898 snuff has been classed with these tobaccos. With the exception of the act of 1901, flat rates have been applied to cigarettes since 1867, so far as concerns value, but since 1868 there has been a difference in rates as between cigarettes weighing not more than 3 pounds per 1,000 and those weighing more than 3 pounds. The same distinction as to weight was first applied to cigars in 1897.

The amount of revenue derived from internal-revenue taxes in 1863 was somewhat more than \$3,000,000, while 10 years later the amount was more than \$34,000,000. In 1902 the revenue amounted to nearly \$52,000,000, in 1917 over \$103,000,000, and in 1920 approximately \$294,000,000. The total revenue derived from these taxes from 1862 to 1921, inclusive, a period of 60 years, was considerably over \$3,000,000,000.

The following summary, based on compilations by the Commissioner of Internal Revenue, United States Treasury Department, shows the rates of taxation on cigars and cigarettes as fixed in internal revenue acts from 1862 to date. Only half of the increase in rates provided in the act of October 3, 1917, were applicable during the first month of its operation.

Date of internal revenue acts imposing tax on cigars and cigarettes and rates of tax.

Date of act (and when effective).	Product.	Rate of tax.	Length of time in effect
		<i>Per 1,000.</i>	<i>Months.</i>
July 1, 1862 (Sept. 1, 1862).	Cigars, valued at not over \$5 per 1,000.....	\$1. 50	22
	Valued at over \$5 and not over \$10 per 1,000.....	2. 00	22
	Valued at over \$10 and not over \$20 per 1,000.....	2. 50	22
	Valued at over \$20 per 1,000.....	3. 50	22
June 30, 1864 (June 30, 1864).	Cheroots valued at not over \$5 per 1,000.....	3. 00	9
	Cigars valued at not over \$5 per 1,000.....	3. 00	9
	Valued at over \$5 and not over \$15 per 1,000.....	8. 00	9
	Valued at over \$15 and not over \$30 per 1,000.....	15. 00	9
	Valued at over \$30 and not over \$45 per 1,000.....	25. 00	9
	Valued at over \$45 per 1,000.....	40. 00	9
	Cigarettes valued at not over \$6 per 100 packages of 25 each.	¹ 1. 00	9
	Valued at over \$6 per 100 packages of 25 each.....	¹ 3. 00	9
	Cigarettes made wholly of tobacco.....	3. 00	9
Mar. 3, 1865 (Apr. 1, 1865).	Cigars and cheroots made wholly of tobacco or of any substitutes therefor.	10. 00	16
	Cigarettes valued at not over \$5 per 100 packages of 25 each.	² . 05	16
	Valued at over \$5 per 100 packages of 25 each.....	² . 05	16
	Cigarettes made wholly of tobacco or of any substitutes therefor.	10. 00	16

Per 100 packages. ²Per package. ³ Per cent.

*Date of internal revenue acts imposing tax on cigars and cigarettes
and rates of tax—Continued.*

Date of act (and when effective).	Product.	Rate of tax.	Length of time in effect.
		<i>Per 1,000.</i>	<i>Months.</i>
July 13, 1866 (Aug. 1, 1866).	Cigars, cigarettes, and cheroots valued at \$8 per 1,000 or less.	\$2.00	7
	Valued at over \$8 and not over \$12.....	4.00	7
	Valued at over \$12 per 1,000.....	4.00	7
Mar. 2, 1867.....	Cigars, cigarettes, and cheroots of all descriptions.....	5.00	17
July 20, 1868 (July 20, 1868).	Cigars and cheroots of all descriptions.....	5.00	79
	Cigarettes weighing not over 3 pounds per 1,000.....	1.50	79
	Weighing over 3 pounds per 1,000.....	5.00	79
Mar. 3, 1875 (Mar. 3, 1875).	Cigars and cheroots of all descriptions.....	6.00	98
	Cigarettes weighing not over 3 pounds per 1,000.....	1.75	98
	Weighing over 3 pounds per 1,000.....	6.00	98
Mar. 3, 1883 (May 1, 1883).	Cigars and cheroots of all descriptions.....	3.00	183
	Cigarettes weighing not over 3 pounds per 1,000.....	.50	172
	Weighing over 3 pounds per 1,000.....	3.00	183
July 24, 1897 (Aug. 15, 1897).	Cigars weighing more than 3 pounds per 1,000.....	3.00	10
	Weighing not more than 3 pounds per 1,000.....	1.00	47
	Cigarettes weighing more than 3 pounds per 1,000.....	3.00	10
	Weighing not more than 3 pounds per 1,000.....	1.00	10
June 13, 1898 (June 14, 1898).	Cigars weighing more than 3 pounds per 1,000.....	3.60	37
	Weighing not more than 3 pounds per 1,000.....	1.00	37
	Cigarettes weighing more than 3 pounds per 1,000.....	3.60	49
	Weighing not more than 3 pounds per 1,000.....	1.50	37
Mar. 2, 1901 (July 1, 1901).	Cigars weighing more than 3 pounds per 1,000.....	3.00	.....
	Weighing not more than 3 pounds per 1,000.....	.54	108
Apr. 12, 1902 (July 1, 1902).	Cigarettes weighing more than 3 pounds per 1,000.....	3.00	96
	Weighing not more than 3 pounds per 1,000 of wholesale value or price of—		
Mar. 2, 1901 (July 1, 1901).	Not over \$2 per 1,000.....	.54	108
	More than \$2 per 1,000.....	1.08	108
Aug. 5, 1909 (July 1, 1910).	Cigars weighing more than 3 pounds per 1,000.....	3.00	87
	Weighing not more than 3 pounds per 1,000.....	.75	87
	Cigarettes weighing more than 3 pounds per 1,000.....	3.60	87
	Weighing not more than 3 pounds per 1,000.....	1.25	87
Oct. 3, 1917 (Oct. 4, 1917).	Classes A-D, cigars, weighing more than 3 pounds per 1,000, if manufactured or imported to retail at:		
	(A) Less than 4 cents each.....	3.00	16
	(B) 4 cents or more and not over 7 cents each....	4.00	16
	(C) More than 7 cents and not over 15 cents each..	6.00	16
	(D) More than 15 cents and not over 20 cents each..	8.00	16
	Class E, cigars, weighing more than 3 pounds per 1,000, if manufactured or imported to retail at over 20 cents each.	10.00	16
	Cigars weighing not more than 3 pounds per 1,000..	1.00	16
	Cigarettes weighing not more than 3 pounds per 1,000.	2.05	16
	Cigarettes weighing more than 3 pounds per 1,000..	4.80	16

⁴And 20 per cent.

*Date of internal revenue acts imposing tax on cigars and cigarettes
and rates of tax—Continued.*

Date of act (and when effective).	Product.	Rate of tax.	Length of time ineffect.
		<i>Per 1,000.</i>	<i>Months.</i>
Feb. 24, 1919 (Feb. 25, 1919).	Classes A-D, cigars, weighing more than 3 pounds per 1,000, if manufactured or imported to retail at:		
	(A) Not more than 5 cents each.....	\$4. 00	33
	(B) More than 5 cents and not more than 8 cents each.	6. 00	33
	(C) More than 8 cents and not more than 15 cents each.	9. 00	33
	(D) More than 15 cents and not more than 20 cents each.	12. 00	33
Feb. 24, 1919 (Feb. 25, 1919).	Class E cigars, weighing more than 3 pounds per 1,000, if manufactured or imported to retail at over 20 cents each.	15. 00	33
	Cigars weighing not more than 3 pounds per 1,000.	1. 50	33
	Cigarettes weighing not more than 3 pounds per 1,000.	3. 00	33
	Cigarettes weighing more than 3 pounds per 1,000.	7. 20	33
Nov. 23, 1921 (Nov. 23, 1921).	Cigars, made of tobacco or any substitute, weighing more than 3 pounds per 1,000, if manufactured or imported to retail at:		
	(A) Not more than 5 cents each.....	4. 00	.....
	(B) More than 5 cents and not more than 8 cents each.	6. 00	.....
	(C) More than 8 cents and not more than 15 cents each.	9. 00	.....
	(D) More than 15 cents and not more than 20 cents each.	12. 00	.....
	(E) More than 20 cents each.....	15. 00	.....
	Cigars, made of tobacco or any substitute, weighing not more than 3 pounds per 1,000.	1. 50	.....
	Cigarettes, made of tobacco or any substitute, weigh- ing more than 3 pounds per 1,000.	7. 20	.....
	Cigarettes, made of tobacco or any substitute, weigh- ing not more than 3 pounds per 1,000.	3. 00	.....

In the following summary, based on compilations by the Commissioner of Internal Revenue, are shown the rates of taxation applying to smoking and chewing tobaccos and snuff, as fixed in internal revenue acts from 1862 to date. Only one-half of the increase in rates provided in the act of October 3, 1917, was applicable during the first month of its operation.

Dates of internal revenue acts imposing tax on chewing and pipe-smoking tobaccos and snuff, and rates of tax.

Date of act (and when effective).	Form of manufacture.	Rate of tax per pound.	Length of time in effect.
		Cents.	Months.
July 1, 1862 (July 1, 1862).	Smoking, made exclusively of stems.....	2	.....
	Smoking, prepared with all the stems in.....	5	22
	Cavendish, plug, twist, fine cut, valued at not over 30 cents per pound.	10	6
	Cavendish, plug, twist, fine cut, valued at over 30 cents per pound.	15	6
	Snuff.....	20	22
Mar. 3, 1863 (Mar. 3, 1863).	Smoking, made exclusively of stems.....	5	1
	Cavendish, plug, twist, fine cut, and manufactured tobacco of all descriptions, except smoking tobacco.	15	16
June 30, 1864 (June 30, 1864).	Smoking, made exclusively of stems.....	15	25
	Smoking, prepared with all the stems in, and fine-cut shorts.	25	9
	Cavendish, plug, twist, etc., and fine-cut chewing....	35	9
	Snuff.....	35	9
	Twisted by hand.....	30	16
Mar. 3, 1865 (Apr. 1, 1865).	Smoking, of all kinds, not otherwise provided for....	35	16
	Cavendish, plug, twist, etc., and fine-cut chewing....	40	16
	Snuff.....	40	40
	Smoking, not sweetened, stemmed, or butted.....	15	24
July 13, 1866 (Aug. 1, 1866).	Twisted by hand, etc., and fine-cut shorts.....	30	24
	Smoking, sweetened, stemmed, or butted.....	40	24
	Chewing.....	40	24
	Chewing, etc., smoking, etc., part of the stems removed	32	47
	Smoking, exclusively of stems, etc.....	16	47
July 20, 1868 (July 20, 1868).	Snuff.....	32	129
	All kinds, except snuff, cigars, cheroots, and cigarettes.	20	32
	.....do.....	24	50
June 6, 1872 (July 1, 1872).	.....do.....	24	50
Mar. 3, 1875 (Mar. 3, 1875).	.....do.....	24	50
Mar. 1, 1879 (May 1, 1879).	All kinds, except snuff, cigars, cheroots, and cigarettes.	16	48

Dates of internal revenue acts imposing tax on chewing and pipe-smoking tobaccos and snuff, and rates of tax—Continued.

Date of act (and when effective).	Form of manufacture.	Rate of tax per pound.	Length of time in effect.
		<i>Cents.</i>	<i>Months.</i>
Mar. 3, 1883 (May 1, 1883).	All kinds, except snuff, cigars, cheroots, and cigarettes.	8	91
Oct. 1, 1890 (Jan. 1, 1891).	Smoking and manufactured tobacco and snuff.....	6	90
June 13, 1898 (June 14, 1898).	Manufactured tobacco and snuff.....	12	49
Apr. 12, 1902 (July 1, 1902).	.....do.....	6	96
Aug. 5, 1909 (July 1, 1910).	.....do.....	8	86
Oct. 3, 1917 (Nov. 2, 1917).	.....do.....	13	15
Feb. 24, 1919 (Feb. 25, 1919).	.....do.....	18	33
Nov. 23, 1921 (Nov. 23, 1921).	.....do.....	18	.....

Summary and Outlook.

Concomitant with the comparatively steady expansion in acreage and production of tobacco during and since colonial days the industry has undergone a high degree of specialization. Primarily as a result of the exacting requirements as to soil and climate for producing the particular kinds of tobacco needed for various purposes of manufacture and export, tobacco culture has become sharply localized. Each producing section supplies a definite type peculiarly suited for specific trade purposes. Other sections formerly growing tobacco but having soil and climatic conditions less favorable for producing the types now in demand have been forced to abandon the crop. These distinctive types are in large measure noncompetitive, so that important economic changes or tendencies may have very different effects on the various centers of production.

The Tobacco Crop as a Whole.

Considering the tobacco crop as a whole there has been marked and almost continuous increase in production during the past 40 years. The rate of increase has more than kept pace with the increase in population. Under a well-balanced system of diversified farming, including winter feeding of steers, the yield per acre of tobacco shows an upward tendency. Under a highly intensive one-crop system, heavy fertilizing and manuring is apparently failing to maintain yields at the high levels which were first established. With an extensive system on rather poor soils, in which cropping to tobacco alternates with a period of "resting" the land, the yield is being maintained, though at a relatively low level. Under these circumstances the level of yields has been considerably raised by use of commercial fertilizers. Imports of tobacco are considerable and have increased decidedly in recent years, though in the aggregate they amount to hardly more than 10 per cent of exports. A large proportion of the leaf tobacco imported is used for blending purposes and therefore does not come into competition with domestic leaf. Net exports of tobacco, though large and increasing, have not kept pace with the increase in production. Serious effort is being made in various parts of the world to produce tobaccos similar to those exported from this country, but it remains to be seen what success will follow these endeavors. Domestic consumption of tobacco has been increasing steadily for many years, and even on a per capita basis this increase has been considerable. The tobacco industry reacted sharply to conditions created by the World War. Abnormally high prices resulting from greatly increased foreign and domestic demand stimulated heavy production which culminated in a crop of more than 1½ billion pounds in 1920. The precipitate drop in prices in that year for a crop grown at heavy cost resulted in serious losses. Largely as a consequence of these conditions production in 1921 virtually receded to the prewar level of

1 billion pounds. The average farm price for the 1921 crop was about 89 per cent above prewar figures.

Relative Position of the Distinctive Types of Tobacco.

With respect to the several distinctive types of tobacco, significant changes have taken place both at home and abroad in popularity of the different forms in which tobacco is consumed. These changes necessarily affect the relative demand of the different types of leaf. Maximum production of chewing tobaccos was virtually reached as early as 1897. On the other hand, production of pipe-smoking tobaccos increased rapidly until about 1910, while the subsequent rate of increase has been much slower. Manufacture of cigars increased rapidly until about 1906, but since that time the rate of increase has fallen off. Beginning about 1910 the production of machine-made cigarettes began to increase with remarkable rapidity, and this rate of increase has been steadily maintained. It is apparent that chewing is less popular than formerly and is giving way to smoking, and the cigarette is now becoming the favorite smoke. In line with these facts there has been a very large increase in production of the bright flue-cured tobacco, which is the leading cigarette and granulated pipe-smoking type, with an upward trend in price. There has been, moreover, an increasing foreign demand for this type, thus placing it in a relatively strong position. Flue-cured tobacco has long occupied an important position in the manufacture of plug, but any loss in demand in this direction has been more than offset by the gain in domestic and foreign demand for smoking purposes. Burley, which has been the leading type of leaf for the manufacture of plug, also has recently come into great demand for cigarette and smoking grades of leaf, the net result being a moderate increase in total demand for this type. The dark fire-cured and air-cured tobaccos have always been mainly export types, domestic use being confined mostly to the production of chewing tobacco and snuff. Foreign markets are indicating more and more a preference for the light colored cigarette types of leaf, at least so far as concerns increased purchases in this country. As would be

expected from these facts, there has been no notable permanent increase in production of the dark types in recent years. Cigar leaf is largely restricted to a single domestic use, and production has shown but little increase in the past decade, thus further indicating a slowing down of the increase in consumption of cigars.

Tobacco Culture in New Territory.

The question is frequently raised whether tobacco could be grown with profit in sections where it is not at present a commercial crop. In the search for new crops in various regions it is natural that attention should be directed toward tobacco because of the fact that it is a cash crop of high acre value. For the five-year period ending with 1920 the average acre value of tobacco was approximately \$205, as compared with \$126 for potatoes, \$42 for cotton, and \$26 for hay. There are two principal aspects of the question as to prospects for tobacco culture in new territory, namely, whether present production fully equals the demand and whether new regions could successfully compete with the sections already growing tobacco. As a matter of fact, from the earliest days of the colonists overproduction has been the one greatest menace to profitable tobacco culture. In most of the principal centers of production less than 10 per cent of the total acreage of the tobacco farms is devoted to this crop each year and rising prices for tobacco are almost invariably followed by marked increase in production. In recent years by far the most marked increase in demand and in production has been in the flue-cured type of the South Atlantic States, but in these States there is a very large acreage of land lying idle which is not sufficiently productive for general farming but is available for meeting any increase in demand for flue-cured tobacco. It is apparent, therefore, that commercial tobacco culture in new territory must be at the expense of the established producing districts. As bearing on the second phase of the question, it has already been made clear that through a long process of evolution and specialization tobacco production has become definitely localized, each region because of its particular combination of soil and climate producing a type of leaf

peculiarly suited for certain uses and differing in important characteristics from other types. So marked are the effects of soil and climate that it rarely if ever happens that two different regions will produce exactly the same type of leaf, and for this reason the trade usually looks to some particular section producing tobacco of known characteristics for the required supply of each of the commercial types of leaf. Under ordinary circumstances, therefore, commercial tobacco culture is not likely to prove successful in new territory.

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